

INVITATION TO TENDER

RETURN BIDS TO:

Bid Receiving / Agriculture and Agri-Food Canada

Agriculture and Agri-Food Canada
 Eastern Service Centre
 Tender Receiving Unit
 2001 Robert-Bourassa Blvd., Suite 671-TEN
 Montréal, Quebec
 H3A 3N2

TENDER TO:

Agriculture and Agri-Food Canada

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

Comments

ISSUING OFFICE

Agriculture and Agri-Food Canada
 Eastern Service Centre
 Tender Receiving Unit
 2001 Robert-Bourassa Blvd., Suite 671-TEN
 Montréal, Quebec
 H3A 3N2

Title	
Entomology Lab project in St-John's	
Solicitation No.	Date
01B46-15-0188	2015-11-19
Client Reference No.	
1516-143110-p08	
File No.	
01B46-15-0188	
Solicitation Closes:	
Tuesday, December 8, 2015, at 02:00 PM, EST.	
F.O.B	
<input type="radio"/> Plant <input checked="" type="radio"/> Destination <input type="radio"/> Other	
Address Enquiries to:	
Carol Rahal	
Title:	
Contracting Agent	
Email:	
carol.rahal@agr.gc.ca	
Telephone Number	Ext.
514 315-6143	
Fax Number	
514 283-1918	
Destination	
Buiding 25 308 Brookfield Road St-John's, Newfoundland	

Instructions: See Herein

Delivery Required	Delivery Offered
31 March 2016	
Vendor / Firm Name and Address	
Telephone Number	Ext.
Fax Number	
Name and title of person authorized to sign on behalf of Vendor / Firm (type or print)	
Signature	Date
_____	_____



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Forms

- Bid Bond
- Certificate of Insurance
- Labour and Material Payment Bond
- Performance Bond
- T4-A Certification
- Personnel Screening, Consent and Authorization Form



Appendix "A"

GENERAL INSTRUCTIONS TO BIDDERS

GENERAL INSTRUCTIONS TO BIDDERS

- GI01 Completion of Bid
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- GI14 Conflict of Interest – Unfair Advantage

GI01 COMPLETION OF BID

- 1) The bid shall be:
 - (a) submitted on the BID AND ACCEPTANCE FORM provided by AAFC with the bid package or on a clear and legible reproduced copy of such BID AND ACCEPTANCE FORM that must be identical in content and format to the BID AND ACCEPTANCE FORM provided by AAFC;
 - (b) based on the Bid Documents listed in the Special Instructions to Bidders;
 - (c) correctly completed in all respects;
 - (d) signed, with an original signature, by a duly authorized representative of the Bidder; and
 - (e) accompanied by
 - (i) bid security as specified in GI07; and
 - (ii) any other document or documents specified elsewhere in the solicitation where it is stipulated that said documents are to accompany the bid.
- 2) Subject to paragraph 6) of GI10, any alteration to the pre-printed or pre-typed sections of the Bid and Acceptance Form, or any condition or qualification placed upon the bid shall be cause for disqualification. Alterations, corrections, changes or erasures made to statements or figures entered on the Bid and Acceptance Form by the Bidder shall be initialed by the person or persons signing the bid. Alterations, corrections, changes or erasures that are not initialed shall be deemed void and without effect.
- 3) Unless otherwise noted elsewhere in the Bid Documents, facsimile copies of bids are not acceptable.

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

GI02 IDENTITY OR LEGAL CAPACITY OF THE BIDDER

- 1) In order to confirm the authority of the person or persons signing the bid or to establish the legal capacity under which the Bidder proposes to enter into Contract, any Bidder who carries on business in other than its own personal name shall, if requested by Canada, provide satisfactory proof of
 - (a) such signing authority; and
 - (b) the legal capacity under which it carries on business;

prior to contract award. Proof of signing authority may be in the form of a certified copy of a resolution naming the signatory(ies) that is (are) authorized to sign this bid on behalf of the corporation or partnership. Proof of legal capacity may be in the form of a copy of the articles of incorporation or the registration of the business name of a sole proprietor or partnership.

GI03 APPLICABLE TAXES

- 1) "Applicable Taxes" means the Goods and Services Tax (GST), the Harmonized Sales Tax (HST), and any provincial tax, by law, payable by Canada such as, the Quebec Sales Tax (QST) as of April 1, 2013.

GI04 CAPITAL DEVELOPMENT AND REDEVELOPMENT CHARGES

- 1) For the purposes of GC1.8 LAWS, PERMITS AND TAXES in the General Conditions of the Contract, only fees or charges directly related to the processing and issuing of building permits shall be included. The Bidder shall not include any monies in the bid amount for special municipal development, redevelopment or other fees or charges which a municipal authority may seek as a prerequisite to the issuance of building permits.

GI05 REGISTRY AND PRE-QUALIFICATION OF FLOATING PLANT

- 1) Dredges or other floating plant to be used in the performance of the Work must be of Canadian registry. For dredges or other floating plant that are not of Canadian make or manufacture, the Bidder must obtain a certificate of qualification from Industry Canada and this certificate must accompany the bid. Plant so qualified by Industry Canada may be accepted on this project.

GI06 LISTING OF SUBCONTRACTORS AND SUPPLIERS

- 1) Notwithstanding any list of Subcontractors that the Bidder may be required to submit as part of the bid, the Bidder shall, within 48 hours of receipt of a notice to do so, submit all information requested in the said notice including the names of Subcontractors and Suppliers for the part or parts of the Work listed. Failure to do so shall result in the disqualification of its bid.

GI07 BID SECURITY REQUIREMENTS

- 1) The Bidder shall submit bid security with the bid in the form of a bid bond or a security deposit in an amount that is equal to not less than 10 percent of the bid amount. Applicable Taxes shall not be included when calculating the amount of any bid security that may be required. The maximum amount of bid security required with any bid is \$2,000,000.00.

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

- 2) A bid bond shall be in an approved form <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494§ion=text#appS>, properly completed, with original signature(s) and issued by an approved company whose bonds are acceptable to Canada either at the time of solicitation closing or as identified in Treasury Board Appendix L: [Acceptable Bonding Companies](#).
- 3) A security deposit shall be an original, properly completed, signed where required and be either:
 - (a) a bill of exchange, bank draft or money order made payable to the Receiver General for Canada and certified by an approved financial institution or drawn by an approved financial institution on itself; or
 - (b) bonds of, or unconditionally guaranteed as to principal and interest by, the Government of Canada;
- 4) For the purposes of subparagraph 3) (a) of GI07
 - (a) a bill of exchange is an unconditional order in writing signed by the Bidder and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable future time a sum certain of money to, or to the order of, the Receiver General for Canada;
 - (b) if a bill of exchange, bank draft or money order is certified by or drawn on an institution or corporation other than a chartered bank, it must be accompanied by proof that the said institution or corporation meets at least one of the criteria described in subparagraph 4.c. of GI07, either by letter or by a stamped certification on the bill of exchange, bank draft or money; and
 - (c) An approved financial institution is:
 - (i) a corporation or institution that is a member of the Canadian Payments Association as defined in the [Canadian Payments Act](#);
 - (ii) a corporation that accepts deposits that are insured, to the maximum permitted by law, by the Canada Deposit Insurance Corporation or the "Autorité des marchés financiers";
 - (iii) a corporation that accepts deposits from the public if repayment of the deposit is guaranteed by Her Majesty the Queen in right of a province;
 - (iv) a corporation, association or federation incorporated or organized as a credit union or co-operative credit society that conforms to the requirements of a credit union which are more particularly described in paragraph 137(6) of the [Income Tax Act](#); or
 - (v) Canada Post Corporation.
- 5) Bonds referred to in subparagraph 3)(b) of GI07 shall be provided on the basis of their market value current at the date of solicitation closing, and shall be:
 - (a) payable to bearer;
 - (b) accompanied by a duly executed instrument of transfer of the bonds to the Receiver General for Canada in the form prescribed by the Domestic Bonds of Canada Regulations; or
 - (c) registered as to principal or as to principal and interest in the name of the Receiver General for Canada pursuant to the Domestic Bonds of Canada Regulations.

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

- 6) As an alternative to a security deposit an irrevocable standby letter of credit is acceptable to Canada and the amount shall be determined in the same manner as a security deposit referred to above.
- 7) An irrevocable standby letter of credit referred to in paragraph 6) of GI07 shall
 - (a) be an arrangement, however named or described, whereby a financial institution (the "Issuer") acting at the request and on the instructions of a customer (the "Applicant) or on its own behalf,
 - (i) is to make a payment to, or to the order of, the Receiver General for Canada as the beneficiary;
 - (ii) is to accept and pay bills of exchange drawn by the Receiver General for Canada;
 - (iii) authorizes another financial institution to effect such payment or accept and pay such bills of exchange; or
 - (iv) authorizes another financial institution to negotiate against written demand(s) for payment provided that the terms and conditions of the letter of credit are complied with;
 - (b) state the face amount which may be drawn against it;
 - (c) state its expiry date;
 - (d) provide for sight payment to the Receiver General for Canada by way of the financial institution's draft against presentation of a written demand for payment signed by the Departmental Representative identified in the letter of credit by his/her office;
 - (e) provide that more than one written demand for payment may be presented subject to the sum of those demands not exceeding the face value of the letter of credit;
 - (f) provide that it is subject to the International Chamber of Commerce (ICC) Uniform Customs and Practice (UCP) for Documentary Credits, 2007 Revision, ICC Publication No. 600; pursuant to the ICC UCP; a credit is irrevocable even if there is no indication to that effect; and
 - (g) be issued or confirmed, in either official language, by a financial institution which is a member of the Canadian Payments Association and is on the letterhead of the Issuer or Confirmer. The format is left to the discretion of the Issuer or Confirmer.
- 8) Bid security shall lapse or be returned as soon as practical following:
 - (a) the solicitation closing date, for those Bidders submitting non-compliant bids; and
 - (b) the administrative bid review, for those Bidders submitting compliant bids ranked fourth to last on the schedule of bids; and
 - (c) the award of contract, for those Bidders submitting the second and third ranked bids; and
 - (d) the receipt of contract security, for the successful Bidder; or
 - (e) the cancellation of the solicitation, for all Bidders.
- 9) Notwithstanding the provisions of paragraph 8) of GI07 and provided more than three compliant bids have been received, if one or more of the bids ranked third to first is withdrawn or rejected

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

for whatever reason then Canada reserves the right to hold the security of the next highest ranked compliant bid in order to retain the bid security of at least three valid and compliant bids.

GI08 SUBMISSION OF BID

- 1) The Bid and Acceptance Form, duly completed, and the bid security shall be enclosed and sealed in an envelope provided by the Bidder, and shall be addressed and submitted to the office designated on the INVITATION TO TENDER Form for the receipt of bids. The bid must be received on or before the date and time set for solicitation closing.
- 2) Unless otherwise specified in the Special Instructions to Bidders
 - (a) the bid shall be in Canadian currency;
 - (b) exchange rate fluctuation protection is not offered; and
 - (c) any request for exchange rate fluctuation protection shall not be considered.
- 3) Prior to submitting the bid, the Bidder shall ensure that the following information is clearly printed or typed on the face of the bid envelope:
 - (a) Solicitation Number;
 - (b) Name of Bidder;
 - (c) Return address; and
 - (d) Closing Date and Time.
- 4) Timely and correct delivery of bids is the sole responsibility of the Bidder.

GI09 REVISION OF BID

- 1) A bid submitted in accordance with these instructions may be revised by letter or facsimile provided the revision is received at the office designated for the receipt of bids, on or before the date and time set for the closing of the solicitation. The letter or facsimile shall be on the Bidder's letterhead or bear a signature that identifies the Bidder;
- 2) A revision to a bid that includes unit prices must clearly identify the changes(s) in the unit price(s) and the specific item(s) to which each change applies.
- 3) A letter or facsimile submitted to confirm an earlier revision shall be clearly identified as a confirmation.
- 4) Failure to comply with any of the above provisions shall result in the rejection of the non-compliant revision(s) only. The bid shall be evaluated based on the original bid submitted and all other compliant revision(s).

GI10 REJECTION OF BID

- 1) Canada may accept any bid, whether it is the lowest or not, or may reject any or all bids.
- 2) Without limiting the generality of paragraph 1) of GI10, Canada may reject a bid if any of the following circumstances is present:

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

- (a) the Bidder, or any employee or subcontractor included as part of the bid, has been convicted under Section 121 ("Frauds on the government" & "Contractor subscribing to election fund"), 124 "Selling or purchasing office"), 380 ("Fraud committed against Her Majesty") or 418 ("Selling defective stores to Her Majesty") of the Criminal Code of Canada, or under paragraph 80(1)(d) ("False entry, certificate or return"), subsection 80(2) ("Fraud against Her Majesty") or Section 154.01 ("Fraud against Her Majesty") of the *Financial Administration Act*;
 - (b) the Bidder's bidding privileges are suspended or are in the process of being suspended;
 - (c) the bidding privileges of any employee or subcontractor included as part of the bid are suspended or are in the process of being suspended, which suspension or pending suspension would render that employee or subcontractor ineligible to bid on the Work, or the portion of the Work the employee or subcontractor is to perform;
 - (d) the Bidder is bankrupt, or where for whatever reason, its activities are rendered inoperable for an extended period;
 - (e) evidence, satisfactory to Canada, of fraud, bribery, fraudulent misrepresentation or failure to comply with any law protecting individuals against any manner of discrimination, has been received with respect to the Bidder, any of its employees or any subcontractor included as part of its bid;
 - (f) evidence satisfactory to Canada that based on past conduct or behavior, the Bidder, a sub-contractor or a person who is to perform the Work is unsuitable or has conducted himself/herself improperly;
 - (g) with respect to current or prior transactions with Canada
 - (i) Canada has exercised, or intends to exercise, the contractual remedy of taking the work out of the contractor's hands with respect to a contract with the Bidder, any of its employees or any subcontractor included as part of its bid; or
 - (ii) Canada determines that the Bidder's performance on other contracts is sufficiently poor to jeopardize the successful completion of the requirement being bid on.
- 3) In assessing the Bidder's performance on other contracts pursuant to subparagraph 2)(g)(ii) of GI10, Canada may consider, but not be limited to, such matters as:
- (a) the quality of workmanship in performing the Work;
 - (b) the timeliness of completion of the Work;
 - (c) the overall management of the Work and its effect on the level of effort demanded of the department and its representative; and
 - (d) the completeness and effectiveness of the Contractor's safety program during the performance of the Work.
- 4) Without limiting the generality of paragraphs 1), 2) and 3) of GI10, Canada may reject any bid based on an unfavourable assessment of the:
- (a) adequacy of the bid price to permit the work to be carried out and, in the case of a bid

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

providing prices per unit or a combination of lump sum and prices per unit, whether each such price reasonably reflects the cost of performing the part of the work to which that price applies;

- (b) Bidder's ability to provide the necessary management structure, skilled personnel, experience and equipment to perform competently the work under the Contract; and
 - (c) Bidder's performance on other contracts.
- 5) Where Canada intends to reject a bid pursuant to a provision of paragraphs 1), 2), 3) or 4) of GI10, other than subparagraph 2)(g) of IT10, the contracting authority will inform the Bidder and provide the Bidder ten (10) days within which to make representations, before making a final decision on the bid rejection.
- 6) Canada may waive informalities and minor irregularities in bids received if Canada determines that the variation of the bid from the exact requirements set out in the Bid Documents can be corrected or waived without being prejudicial to other Bidders.

GI11 BID COSTS

- 1) No payment will be made for costs incurred in the preparation and submission of a bid in response to the bid solicitation. Costs associated with preparing and submitting a bid, as well as any costs incurred by the Bidder associated with the evaluation of the bid, are the sole responsibility of the Bidder.

GI12 COMPLIANCE WITH APPLICABLE LAWS

- 1) By submission of a bid, the Bidder certifies that the Bidder has the legal capacity to enter into a contract and is in possession of all valid licences, permits, registrations, certificates, declarations, filings, or other authorizations necessary to comply with all federal, provincial and municipal laws and regulations applicable to the submission of the bid and entry into any ensuing contract for the performance of the work.
- 2) For the purpose of validating the certification in paragraph 1) of GI12, a Bidder shall, if requested, provide a copy of every valid licence, permit, registration, certificate, declaration, filing or other authorization listed in the request, and shall provide such documentation within the time limit(s) set out in the said request.
- 3) Failure to comply with the requirements of paragraph 2) of GI12 shall result in disqualification of the bid.

GI13 APPROVAL OF ALTERNATIVE MATERIALS

- 1) When materials are specified by trade names or trademarks, or by manufacturers' or suppliers' names, the bid shall be based on use of the named materials. During the solicitation period, alternative materials may be considered provided full technical data is received in writing by the Contracting Officer at least 10 calendar days prior to the solicitation closing date.

GI14 CONFLICT OF INTEREST - UNFAIR ADVANTAGE

- 1) In order to protect the integrity of the procurement process, bidders are advised that Canada may reject a bid in the following circumstances:

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

- (a) if the Bidder, any of its subcontractors, any of their respective employees or former employees was involved in any manner in the preparation of the bid solicitation or in any situation of conflict of interest or appearance of conflict of interest;
 - (b) if the Bidder, any of its subcontractors, any of their respective employees or former employees had access to information related to the bid solicitation that was not available to other bidders and that would, in Canada's opinion, give or appear to give the Bidder an unfair advantage.
- 2) The experience acquired by a bidder who is providing or has provided the goods and services described in the bid solicitation (or similar goods or services) will not, in itself, be considered by Canada as conferring an unfair advantage or creating a conflict of interest. This bidder remains however subject to the criteria established above.
- 3) Where Canada intends to reject a bid under this section, the Contracting Authority will inform the Bidder and provide the Bidder an opportunity to make representations before making a final decision. Bidders who are in doubt about a particular situation should contact the Contracting Authority before bid closing. By submitting a bid, the Bidder represents that it does not consider itself to be in conflict of interest nor to have an unfair advantage. The Bidder acknowledges that it is within Canada's sole discretion to determine whether a conflict of interest, unfair advantage or an appearance of conflict of interest or unfair advantage exists.



Appendix "B"

SPECIAL INSTRUCTIONS TO BIDDERS

SPECIAL INSTRUCTIONS TO BIDDERS (SI)

SI01	Bid Documents
SI02	Enquiries during the Solicitation Period
SI03	Non-Mandatory Site Visit
S104	Revision of Bid
S105	Bid Results
SI06	Insufficient Funds
SI07	Bid Validity Period
SI08	Construction Documents
SI09	Web Sites
SI10	Personnel Security Requirements

SI01 BID DOCUMENTS

- 1) The following are the bid documents:
 - (a) INVITATION TO TENDER - Page 1 form AAFC / AAC5323-E;
 - (b) SPECIAL INSTRUCTIONS TO BIDDERS form AAFC / AAC5301-E;
 - (c) GENERAL INSTRUCTIONS TO BIDDERS form AAFC / AAC5313-E;
 - (d) Clauses and Conditions identified in "CONTRACT DOCUMENTS";
 - (e) Drawings and Specifications;
 - (f) BID AND ACCEPTANCE form AAFC / AAC5320-E and any Appendices attached thereto; and,
 - (g) Any amendment issued prior to solicitation closing.

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

SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

- 1) Enquiries regarding this bid must be submitted in writing to the Contracting Officer named on the INVITATION TO TENDER - Page 1 as early as possible within the solicitation period. Except for the approval of alternative materials as described in G113 of the GENERAL INSTRUCTIONS TO BIDDERS, enquiries should be received no later than five (5) calendar days prior to the date set for solicitation closing to allow sufficient time to provide a response. Enquiries received after that time may not result in an answer being provided.
- 2) To ensure consistency and quality of the information provided to Bidders, the Contracting Officer shall examine the content of the enquiry and shall decide whether or not to issue an amendment.
- 3) All enquiries and other communications related to this bid sent throughout the solicitation period are to be directed ONLY to the Contracting Officer named on the INVITATION TO TENDER - Page 1. Non-compliance with this requirement during the solicitation period can, for that reason alone, result in disqualification of a bid.

SI03 NON-MANDATORY SITE VISIT

- 1) There will be a site visit on Tuesday, December, 1 , 2015 at
10:00 AM PM NST.

SPECIAL INSTRUCTIONS TO BIDDERS (Continued)

Interested bidders are to meet at:

Building 25, located at 308 Brookfield Road in St-John's, Newfoundland.

SI04 REVISION OF BID

- 1) A bid may be revised by letter or facsimile in accordance with GI09 of the GENERAL INSTRUCTIONS TO BIDDERS. The facsimile number for receipt of revisions is 514 283-1918 .

SI05 BID RESULTS

- 1) Following bid closing, bid results may be obtained from the bid receiving office by email at carol . rahal @agr . gc . ca .

SI06 INSUFFICIENT FUNDING

- 1) In the event that the lowest compliant bid exceeds the amount of funding allocated for the Work, Canada in its sole discretion may:
 - (a) cancel the solicitation; or
 - (b) obtain additional funding and award the Contract to the Bidder submitting the lowest compliant bid; and/or
 - (c) negotiate a reduction in the bid price and/or scope of work of not more than 15% with the Bidder submitting the lowest compliant bid. Should an agreement satisfactory to Canada not be reached, Canada shall exercise option (a) or (b).

SI07 BID VALIDITY PERIOD

- 1) Canada reserves the right to seek an extension to the bid validity period prescribed in Clause 4 of the BID AND ACCEPTANCE Form. Upon notification in writing from Canada, Bidders shall have the option to either accept or reject the proposed extension.
- 2) If the extension referred to in paragraph 1) of SI07 is accepted, in writing, by all those who submitted bids, then Canada shall continue immediately with the evaluation of the bids and its approvals processes.
- 3) If the extension referred to in paragraph 1) of SI07 is not accepted in writing by all those who submitted bids then Canada shall, at its sole discretion, either:
 - (a) continue to evaluate the bids of those who have accepted the proposed extension and seek the necessary approvals; or
 - (b) cancel the invitation to bid.
- 4) The provisions expressed herein do not in any manner limit Canada's rights in law or under GI10 of the GENERAL INSTRUCTIONS TO BIDDERS.

SPECIAL INSTRUCTIONS TO BIDDERS (Continued)

SI08 CONSTRUCTION DOCUMENTS

- 1) The successful contractor will be provided with one paper copy of the sealed and signed plans, the specifications and the amendments upon acceptance of the offer. Additional copies, up to a maximum of two (2), will be provided free of charge upon request by the Contractor. Obtaining more copies shall be the responsibility of the Contractor including costs.

SI09 WEB SITES

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

Treasury Board Appendix L, Acceptable Bonding Companies

<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494§ion=text#appL>

Canadian economic sanctions

<http://www.international.gc.ca/sanctions/index.aspx?lang=eng>

SI10 PERSONNEL SECURITY REQUIREMENTS

- 1) The successful Bidder's personnel, as well as any subcontractor and its personnel, who are required to perform any part of the work pursuant to the subsequent contract, must meet the following contract security requirements:
 - Personnel who are required to perform any part of the work must EACH hold a valid personnel security screening at the level of RELIABILITY STATUS, granted or approved by Agriculture and Agri-Food Canada. Until the security screening of the personnel has been completed satisfactorily by Agriculture and Agri-Food Canada, the Contractor/Subcontractor personnel MAY NOT perform contract work. Each of the proposed staff must complete "Security Clearance Form" (TBS 330-23E) upon request from Canada.



Appendix "C"

BID AND ACCEPTANCE FORM



BID AND ACCEPTANCE FORM

CONSTRUCTION CONTRACT - MAJOR WORKS

BA01 IDENTIFICATION					
Description of the Work					
The Entomology Lab project consists of a complete refurbishment of the existing facility to bring it up to modern laboratory standards. The work will include the removal of asbestos contained within the walls and ceiling as well as the flooring. New casework will be installed that will incorporate the existing and new equipment as well as new upper cabinets with glass doors for better organization of stored supplies. There will be upgrades to the mechanical and electrical services and lighting.					
Solicitation Number 01B46-15-0188			File / Project Number 1516-143110-p08		
BA02 BUSINESS NAME AND ADDRESS OF BIDDER					
Name					
Address					
Unit/Suite/Apt.	Street number	Number suffix	Street name	Street type	Street direction
PO Box or Route Number			Municipality (City, Town, etc.)	Province	Postal code
Phone number		Fax number		Email address	
BA03 THE OFFER					
1) The Bidder offers to Canada as represented by the Minister of Agriculture and Agri-food Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the Total Bid Amount of:					
\$ _____ excluding Applicable Taxes (GST/HST/QST). (to be expressed in numbers only)					
BA04 BID VALIDITY PERIOD					
1) The bid shall not be withdrawn for a period of <u>60</u> days following the date of solicitation closing.					
BA05 APPENDICES					
1) The following appendices are included in this Bid and Acceptance Form:					
<input checked="" type="checkbox"/> Appendix 2					
BA06 ACCEPTANCE AND CONTRACT					
1) Upon acceptance of the Bidder's offer by Canada, a binding Contract shall be formed between Canada and the resulting Contractor. The documents forming the Contract shall be the contract documents referred to in SC01 CONTRACT DOCUMENTS.					
BA07 CONSTRUCTION TIME					
1) The Contractor shall perform and complete the Work <u>on or before</u> <u>2016-03-31</u>					
BA08 BID SECURITY					
1) The Bidder shall enclose bid security with its bid in accordance with GI07 BID SECURITY REQUIREMENTS.					
2) If a security deposit is furnished as bid security, it shall be forfeited in the event that the bid is accepted by Canada and the Contractor fails to provide Contract Security in accordance with GC9 CONTRACT SECURITY, provided that Canada may, if it is in the public interest, waive the right of Canada to forfeiture any or all of the security deposit.					

BA09 SIGNATURE

Name and title of person authorized to sign on behalf of Bidder (type or print)	Name
	Title
	Signature _____ Date _____
	Name
	Title
	Signature _____ Date _____

BID AND ACCEPTANCE FORM
CONSTRUCTION CONTRACT - MAJOR WORKS
APPENDIX 2

LIST OF SUBCONTRACTORS

The Bidder will subcontract the parts of the work listed below to the subcontractor named for each part. The Bidder agrees not to make changes in the list of subcontractors without the written consent of the Departmental Representative. The Bidder understands that for each part of the work, if more than one subcontractor is named, or no subcontractor is named, or, the Bidder fails to state that the work will be done by its own forces where applicable, the bid will be subject to disqualification.

LIST OF EQUIPMENT

LIST OF MATERIALS



Appendix "D"

MAJOR WORKS - GENERAL CONDITIONS



MAJOR WORKS – GENERAL CONDITIONS

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MAJOR WORKS GENERAL CONDITIONS FORM AAFC 5321:

Revision Date

GC1	GENERAL PROVISIONS	Original
GC2	ADMINISTRATION OF THE CONTRACT	Original
GC3	EXECUTION AND CONTROL OF THE WORK	Original
GC4	PROTECTIVE MEASURES	Original
GC5	TERMS OF PAYMENT	Original
GC6	DELAYS AND CHANGES IN THE WORK	Original
GC7	DEFAULT, SUSPENSION OR TERMINATION OF CONTRACT	Original
GC8	DISPUTE RESOLUTION	Original
GC9	CONTRACT SECURITY	Original
GC10	INSURANCE	Original

GC1 GENERAL PROVISIONS

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GC1.1 INTERPRETATION

GC1.1.1 Headings and References

- 1) The headings in the contract documents, other than those in the drawings and specifications, form no part of the Contract but are inserted for convenience of reference only.
- 2) A reference made to a part of the Contract by means of numbers preceded by letters is a reference to the particular part of the Contract that is identified by that combination of letters and numbers and to any other part of the Contract referred to therein.
- 3) A reference to a paragraph or subparagraph followed by an identifying number, letter or combination thereof is, unless specifically stated otherwise, a reference to the paragraph or subparagraph that forms part of the clause within which the reference is made.

GC1.1.2 Terminology

- 1) In the Contract

"Applicable Taxes" means the Goods and Services Tax (GST), the Harmonized Sales Tax (HST), and any provincial tax, by law, payable by Canada such as, the Quebec Sales Tax (QST) as of April 1, 2013;

"Canada", "Crown", "Her Majesty" means Her Majesty the Queen in right of Canada;

"Contract" means the contract documents referred to as such therein and every other document specified or referred to in any of them as forming part of the Contract, all as amended by agreement of the parties;

"Contract Amount" means the amount set out in the Contract to be payable to the Contractor for the Work, subject to the terms and conditions of the Contract, exclusive of Applicable Taxes;

"Contract Security" means any security given by the Contractor to Canada in accordance with the Contract;

"Contractor" means the person contracting with Canada to provide or furnish all labour, Material and Plant for the execution of the Work under the Contract, and includes the Contractor's superintendent as designated in writing to Canada.

"Certificate of Completion" means a certificate issued by Canada when the Work reaches Completion;

"Certificate of Measurement" means a certificate issued by Canada certifying the correctness of the final quantities, prices per unit and values of labour, Plant and Material performed, used and supplied by the Contractor for the construction of the part of the Work to which a Unit Price Arrangement applies;

"Certificate of Substantial Performance" means a certificate issued by Canada when the Work reaches Substantial Performance;

"Departmental Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor;

"herein", "hereby", "hereof", "hereunder" and similar expressions refer to the Contract as a whole and not to any particular section or part thereof;

"Lump Sum Arrangement" means that part of the Contract that prescribes a lump sum as payment for performance of the Work to which it relates;

"Material" includes all commodities, articles, machinery, equipment, fixtures and things required to be furnished in accordance with the Contract for incorporation into the Work;

"person" also includes, unless there is an express stipulation in the Contract to the contrary, any partnership, proprietorship, firm, joint venture, consortium or corporation;

"Plant" includes all tools, implements, machinery, vehicles, structures, equipment, articles and things that are necessary for the performance of the Contract, other than Material and those tools customarily provided by a tradesperson in practicing a trade;

"Subcontractor" means a person having a direct contract with the Contractor, subject to GC3.6 SUBCONTRACTING, to perform a part or parts of the Work, or to supply Material customized for the Work;

"Superintendent" means the employee or representative of the Contractor designated by the Contractor to act pursuant to GC2.6 SUPERINTENDENT;

"Supplementary Conditions" means the part of the Contract that amends or supplements the General Conditions;

"Supplier" means a person having a direct contract with the Contractor to supply Plant or Material not customized for the Work;

"Total Estimated Cost", "Revised Estimated Cost", "Increase (Decrease)" on Page 1 of the Contract or Contract Amendment means an amount used for internal administrative purposes only that comprises the Contract Amount, or the revised Contract Amount, or the amount that would increase or decrease the Contract Amount and the Applicable Taxes as evaluated by the Contracting Authority, and does not constitute tax advice on the part of Canada;

"Unit Price Arrangement" means that part of the Contract that prescribes the product of a price per unit of measurement multiplied by a number of units of measurement for performance of the Work to which it relates;

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

"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 contract documents; and

"Working Day" means a day other than a Saturday, Sunday, or a statutory holiday that is observed by the construction industry in the area of the place of the Work.

GC1.1.3 Application of Certain Provisions

- 1) Any provisions of the Contract that are expressly stipulated to be applicable only to a Unit Price Arrangement are not applicable to any part of the Work to which a Lump Sum Arrangement applies.
- 2) Any provisions of the Contract that are expressly stipulated to be applicable only to a Lump Sum Arrangement are not applicable to any part of the Work to which a Unit Price Arrangement applies.

GC1.1.4 Substantial Performance

- 1) The Work shall be considered to have reached Substantial Performance when
 - (a) the Work or a substantial part thereof has passed inspection and testing and is, in the opinion of Canada, ready for use by Canada or is being used for the intended purposes; and
 - (b) the Work is, in the opinion of Canada, capable of completion or correction at a cost of not more than
 - (i) 3 percent of the first \$500,000;
 - (ii) 2 percent of the next \$500,000; and
 - (iii) 1 percent of the balanceof the Contract Amount at the time this cost is calculated.
- 2) Where the Work or a substantial part thereof is ready for use or is being used for the purposes intended and

- (a) the remainder of the Work or a part thereof cannot be completed by the time specified in the Contract, or as amended in accordance with GC6.5 DELAYS AND EXTENSION OF TIME, for reasons beyond the control of the Contractor; or
- (b) Canada and the Contractor agree not to complete a part of the Work within the specified time;

the cost of that part of the Work that was either beyond the control of the Contractor to complete or Canada and the Contractor have agreed not to complete by the time specified, shall be deducted from the value of the Contract referred to in subparagraph 1)(b) of GC1.1.4 and the said cost shall not form part of the cost of the Work remaining to be done in determining Substantial Performance.

GC1.1.5 Completion

- 1) The Work shall be deemed to have reached Completion when all labour, Plant and Material required have been performed, used or supplied, and the Contractor has complied with the Contract and all orders and directions made pursuant thereto, all to the satisfaction of Canada.

GC1.2 CONTRACT DOCUMENTS**GC1.2.1 General**

- 1) The contract documents are complementary, and what is required by any one shall be as binding as if required by all.
- 2) References in the contract documents to the singular shall be considered to include the plural as the context requires.
- 3) Nothing contained in the contract documents shall create a contractual relationship between Canada and any Subcontractor or Supplier, their subcontractors or suppliers, or their agents or employees.

GC1.2.2 Order of Precedence

- 1) In the event of any discrepancy or conflict in the contents of the following documents, such documents shall take precedence and govern in the following order:
 - (a) any amendment or variation of the contract documents that is made in accordance with the General Conditions;
 - (b) any amendment issued prior to tender closing;
 - (c) Supplementary Conditions;
 - (d) General Conditions;
 - (e) the duly completed Bid and Acceptance Form when accepted;
 - (f) drawings and specifications.

later dates shall govern within each of the above categories of documents.

- 2) In the event of any discrepancy or conflict in the information contained in the drawings and specifications, the following rules shall apply:
 - (a) specifications shall govern over drawings;
 - (b) dimensions shown in figures on a drawings shall govern where they differ from dimensions scaled from the same drawings; and
 - (c) drawings of larger scale govern over those of smaller scale.

GC1.2.3 Security and Protection of Documents and Work

- 1) The Contractor shall guard and protect contract documents, drawings, information, models and copies thereof, whether supplied by Canada or the Contractor, against loss or damage from any cause.
- 2) The Contractor shall keep confidential all information provided to the Contractor by or on behalf of Canada in connection with the Work, and all information developed by the Contractor as part of the Work, and shall not disclose any such information to any person without the written permission of Canada, except that the Contractor may disclose to a subcontractor, authorized in accordance with the Contract, information necessary to the performance of a subcontract. This section does not apply to any information that
 - (a) is publicly available from a source other than the Contractor; or
 - (b) is or becomes known to the Contractor from a source other than Canada, except any source that is known to the Contractor to be under an obligation to Canada not to disclose the information.
- 3) When the Contract, the Work, or any information referred to in paragraph 2) is identified as top secret, secret, confidential, or protected by Canada, the Contractor shall, at all times, take all measures reasonably necessary for the safeguarding of the material so identified, including such measures as may be further specified elsewhere in the Contract or provided, in writing, from time to time by Canada.
- 4) Without limiting the generality of paragraphs 2) and 3) of GC1.2.3, when the Contract, the Work, or any information referred to in paragraph 2) is identified as top secret, secret, confidential or protected by Canada, Canada shall be entitled to inspect the Contractor's premises and the premises of its subcontractors or suppliers and any other person at any tier, for security purposes at any time during the term of the Contract, and the Contractor shall comply with, and ensure that any such subcontractors or suppliers comply with all written instructions issued by Canada dealing with the material so identified, including any requirement that employees of the Contractor and its subcontractors and suppliers and any other person at any tier execute and deliver declarations relating to reliability screenings, security clearances and other procedures.
- 5) The Contractor shall safeguard the Work and the Contract, the specifications, drawings and any other information provided by Canada to the Contractor, and shall be liable to Canada for any loss or damage from any causes.

GC1.3 STATUS OF THE CONTRACTOR

- 1) The Contractor is engaged under the Contract as an independent contractor.

- 2) The Contractor, its subcontractors and suppliers and any other person at any tier and their employees are not engaged by the Contract as employees, servants or agents of Canada.
- 3) For the purposes of the contract the Contractor shall be solely responsible for any and all payments and deductions required to be made by law including those required for Canada or Quebec Pension Plans, Employment Insurance, Worker's Compensation, provincial health or insurance plans, and Income Tax.

GC1.4 RIGHTS AND REMEDIES

- 1) Except as expressly provided in the Contract, the duties and obligations imposed by the Contract and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

GC1.5 TIME OF THE ESSENCE

- 1) Time is of the essence of the Contract.

GC1.6 INDEMNIFICATION BY THE CONTRACTOR

- 1) The Contractor shall pay all royalties and patent fees required for the performance of the Contract and, at the Contractor's expense, shall defend all claims, actions or proceedings against Canada charging or claiming that the Work or any part thereof provided or furnished by the Contractor to Canada infringes any patent, industrial design, copyright trademark, trade secret or other proprietary right enforceable in Canada.
- 2) The Contractor shall indemnify and save Canada harmless from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings by any third party, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by, or attributable to the activities of the Contractor, its subcontractors and suppliers and any other person at any tier, in performing the Work.
- 3) For the purposes of paragraph 2) of GC1.6, "activities" means any act improperly carried out, any omission to carry out an act and any delay in carrying out an act.

GC1.7 INDEMNIFICATION BY CANADA

- 1) Subject to the [Crown Liability and Proceedings Act](#), the [Patent Act](#), and any other law that affects Canada's rights, powers, privileges or obligations, Canada shall indemnify and save the Contractor harmless from and against all claims, demands, losses, costs, damage, actions, suits or proceedings arising out of the Contractor's activities under the Contract that are directly attributable to
 - (a) a lack of or a defect in Canada's title to the Work site if owned by Canada, whether real or alleged; or
 - (b) an infringement or an alleged infringement by the Contractor of any patent of invention or any other kind of intellectual property occurring while the Contractor was performing any act for the purposes of the Contract employing a model, plan or design or any other thing related to the Work that was supplied by Canada to the Contractor.

GC1.8 LAWS, PERMITS AND TAXES

- 1) The Contractor shall comply with all federal, provincial and municipal laws and regulations applicable to the performance of the Work or any part thereof including, without limitation, all laws concerning health and labour conditions and the protection of the environment, and shall require compliance therewith by all of its subcontractors and suppliers at any tier as if the Work were being performed for an owner other than Canada. The Contractor shall furnish evidence of compliance with such laws and regulations to Canada at such times as Canada may reasonably request.
- 2) Unless stipulated otherwise in the Contract, the Contractor shall obtain and maintain all permits, certificates, licences, registrations and authorizations required for the lawful performance of the Work.
- 3) Prior to the commencement of the Work at the site, the Contractor shall tender to a municipal authority an amount equal to all fees and charges that would be lawfully payable to that municipal authority in respect of building permits as if the Work were being performed for an owner other than Canada.
- 4) Within 10 days of making a tender pursuant to paragraph 3) of GC1.8, the Contractor shall notify Canada of the amount properly tendered and whether or not the municipal authority has accepted that amount.
- 5) If the municipal authority has not accepted the amount tendered, the Contractor shall pay that amount to Canada within 6 days after the time stipulated in paragraph 4) of GC1.8.
- 6) For the purposes of this clause, "municipal authority" means any authority that would have jurisdiction respecting permission to perform the Work if the owner were not Canada.
- 7) Notwithstanding the residency of the Contractor, the Contractor shall pay any applicable tax arising from or related to the performance of the Work under the Contract.
- 8) In accordance with the Statutory Declaration referred to in paragraph 4) of GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK, a Contractor who has neither residence nor place of business in the province or territory in which work under the Contract is being performed shall provide Canada with proof of registration with the provincial sales tax authorities in the said province.
- 9) For the purpose of the payment of any Applicable Taxes or the furnishing of security for the payment of any Applicable Taxes arising from or related to the performance of the Work, and notwithstanding the provision that all Material, Plant and interest of the Contractor in all real property, licences, powers and privileges, become the property of Canada after the time of purchase in accordance with GC3.10 MATERIAL PLANT AND REAL PROPERTY BECOME PROPERTY OF CANADA, the Contractor shall be liable, as a user or consumer, for the payment or for the furnishing of security for the payment of any Applicable Taxes payable, at the time of the use or consumption of that Material, Plant or interest of the Contractor in accordance with the relevant legislation.
- 10) Federal government departments and agencies are required to pay Applicable Taxes.
- 11) Applicable Taxes will be paid by Canada as provided in the request for payment. It is the sole responsibility of the Contractor to charge Applicable Taxes at the correct rate in accordance with applicable legislation. The Contractor agrees to remit to appropriate tax authorities any amounts of Applicable Taxes paid or due.

- 12) The Contractor is not entitled to use Canada's exemptions from any tax, such as provincial sales taxes, unless otherwise specified by law. The Contractor must pay applicable provincial sales tax, ancillary taxes, and any commodity tax, on taxable goods or services used or consumed in the performance of the Contract (in accordance with applicable legislation), including for material incorporated into real property.
- 13) In those cases where Applicable Taxes, customs duties, and excise taxes are included in the Contract Amount, the Contract Amount will be adjusted to reflect any increase, or decrease, of Applicable Taxes, customs duties, and excise taxes that will have occurred between bid submission and contract award. However, there will be no adjustment for any change to increase the Contract Amount if public notice of the change was given before bid submission date in sufficient detail to have permitted the Contractor to calculate the effect of the change.
- 14) Tax Withholding of 15 Percent – Canada Revenue Agency

Pursuant to the [Income Tax Act](#), 1985, c. 1 (5th Supp.) and the [Income Tax Regulations](#), Canada must withhold 15 percent of the amount to be paid to the Contractor in respect of services provided in Canada if the Contractor is not a resident of Canada, unless the Contractor obtains a valid waiver from the Canada Revenue Agency. The amount withheld will be held on account for the Contractor in respect to any tax liability which may be owed to Canada.

GC1.9 WORKERS' COMPENSATION

- 1) Prior to commencement of Work, at the time of Substantial Performance of the Work, and prior to issuance of the Certificate of Completion, the Contractor shall provide evidence of compliance with workers' compensation legislation applicable to the place of the Work, including payments due thereunder.
- 2) At any time during the term of the Contract, when requested by Canada, the Contractor shall provide such evidence of compliance by the Contractor, its subcontractors and any other person at any tier and any other person performing part of the Work who is required to comply with such legislation.

GC1.10 NATIONAL SECURITY

- 1) If Canada determines that the Work is of a class or kind that involves national security, Canada may order the Contractor to
 - (a) provide Canada with any information concerning persons employed or to be employed by the Contractor for purposes of the Contract; and
 - (b) remove any person from the site of the Work if, in the opinion of Canada, that person may be a risk to the national security;and the Contractor shall comply with the order.
- 2) In all contracts with persons who are to be employed in the performance of the Contract, the Contractor shall make provision for the performance of any obligation that may be imposed upon the Contractor under paragraph 1) of GC1.10.

GC1.11 UNSUITABLE WORKERS

- 1) Canada shall instruct the Contractor to remove from the site of the Work any person employed by the Contractor for purposes of the Contract who, in the opinion of Canada, is incompetent or is guilty of improper conduct, and the Contractor shall not permit a person who has been removed to return to the site of the Work.

GC1.12 PUBLIC CEREMONIES AND SIGNS

- 1) The Contractor shall not permit any public ceremony in connection with the Work without the prior consent of Canada.
- 2) The Contractor shall not erect nor permit the erection of any sign or advertising on the Work or its site without the prior consent of Canada.

GC1.13 CONFLICT OF INTEREST

- 1) It is a term of the Contract that no individual, for whom the post-employment provisions of the Conflict of Interest and Post-Employment Code for Public Office Holders or the Values and Ethics Code for the Public Service apply, shall derive a direct benefit from the Contract unless that individual is in compliance with the applicable post-employment provisions.

GC1.14 AGREEMENTS AND AMENDMENTS

- 1) The Contract constitutes the entire and sole agreement between the parties with respect to the subject matter of the Contract and supersedes all previous negotiations, communications and other agreements, whether written or oral, relating to it, unless they are incorporated by reference in the Contract. There are no terms, covenants, representations, statements or conditions binding on the parties other than those contained in the Contract.
- 2) The failure of either party at any time to require performance by the other party of any provision hereof shall not affect the right thereafter to enforce such provision. Nor shall the waiver by either party of any breach of any covenant, term or condition hereof be taken to be held to be a waiver of any further breach of the same covenant, term or condition.
- 3) The Contract may be amended only as provided for in the Contract.

GC1.15 SUCCESSION

- 1) The Contract shall inure to the benefit of and be binding upon the parties hereto and their lawful heirs, executors, administrators, successors and, subject to GC1.16 ASSIGNMENT, permitted assigns.

GC1.16 ASSIGNMENT

- 1) The Contractor shall not make any assignment of the Contract, either in whole or in part, without the written consent of Canada.

GC1.17 NO BRIBE

- 1) The Contractor represents and covenants that no bribe, gift, benefit, nor other inducement has been nor shall 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 a person, with a view to influencing the entry into the Contract or the administration of the Contract.

GC1.18 CERTIFICATION - CONTINGENCY FEES

- 1) In this clause
 - (a) "contingency fee" means any payment or other compensation that is contingent upon or is calculated upon the basis of a degree of success in soliciting or obtaining a Government contract or negotiating the whole or any part of its terms;
 - (b) "employee" means a person with whom the Contractor has an employer/employee relationship; and
 - (c) "person" includes an individual or a group of individuals, a corporation, a partnership, an organization and an association and, without restricting the generality of the foregoing, includes any individual who is required to file a return with the registrar pursuant to section 5 of the [Lobbying Act](#) R.S.C. 1985 c.44 (4th Supplement) as the same may be amended from time to time.
- 2) The Contractor certifies that it has not directly or indirectly paid nor agreed to pay and covenants that it shall not directly or indirectly pay nor agree to pay a contingency fee for the solicitation, negotiation or obtaining of the Contract to any person other than an employee acting in the normal course of the employee's duties.
- 3) All accounts and records pertaining to payments of fees or other compensation for the solicitation, obtaining or negotiation of the Contract shall be subject to the accounts and audit provisions of the Contract.
- 4) If the Contractor certifies falsely under this section or is in default of the obligations contained therein, Canada may either take the Work out of the Contractor's hands in accordance with the provisions of the Contract or recover from the Contractor by way of reduction to the Contract Amount or otherwise, the full amount of the contingency fee.

GC1.19 INTERNATIONAL SANCTIONS

- 1) Persons and companies in Canada, and Canadians outside of Canada are bound by economic sanctions imposed by Canada. As a result, the Government of Canada cannot accept delivery of goods or services that originate, either directly or indirectly, from the countries or persons subject to [economic sanctions](#)
- 2) It is a condition of the Contract that the Contractor not supply to the Government of Canada any goods or services which are subject to economic sanctions.
- 3) By law, the Contractor must comply with changes to the regulations imposed during the life of the Contract. During the performance of the Contract should the imposition of sanctions against a country or person or the addition of a good or service to the list of sanctioned goods or services cause an impossibility of performance for the Contractor, the Contractor may request that the Contract be terminated in accordance with GC7.3 TERMINATION OF CONTRACT.

GC2 ADMINISTRATION OF THE CONTRACT

- GC2.1 DEPARTMENTAL REPRESENTATIVE'S AUTHORITY
- GC2.2 INTERPRETATION OF CONTRACT
- GC2.3 NOTICES
- GC2.4 SITE MEETINGS
- GC2.5 REVIEW AND INSPECTION OF WORK
- GC2.6 SUPERINTENDENT
- GC2.7 NON-DISCRIMINATION IN HIRING AND EMPLOYMENT OF LABOUR
- GC2.8 ACCOUNTS AND AUDITS

GC2.1 DEPARTMENTAL REPRESENTATIVE'S AUTHORITY

- 1) Canada shall designate a Departmental Representative and shall notify the Contractor of the name, address and telephone number of the Departmental Representative.
- 2) The Departmental Representative shall perform Canada's duties and functions under the contract.
- 3) The Departmental Representative shall be authorized to issue notices, instructions and directions to the Contractor and to accept on behalf of Canada any notice, order or other communication from the contractor relating to the Work.
- 4) The Departmental Representative shall, within a reasonable time, review and respond to submissions made by the Contractor in accordance with the requirements of the Contract.

GC2.2 INTERPRETATION OF CONTRACT

- 1) If, at any time before Canada has issued a Certificate of Completion, any question arises between the parties about whether anything has been done as required by the Contract or about what the Contractor is required by the Contract to do, and in particular but without limiting the generality of the foregoing, about
 - (a) the meaning of anything in the drawings and specifications;
 - (b) the meaning to be given to the drawings and specifications in case of any error therein, omission therefrom, or obscurity or discrepancy in their wording or intention;
 - (c) whether or not the quality or quantity of any Material or workmanship supplied or proposed to be supplied by the Contractor meets the requirements of the Contract;
 - (d) whether or not the labour, Plant or Material performed, used and supplied by the Contractor for performing the Work and carrying out the Contract are adequate to ensure that the Work shall be performed in accordance with the Contract and that the Contract shall be carried out in accordance with its terms;
 - (e) what quantity of any of the Work has been completed by the Contractor; or
 - (f) the timing and scheduling of the various phases of the performance of the Work as specified in the Contract;

the question shall be decided, subject to the provisions of GC8 DISPUTE RESOLUTION, by Canada.

- 2) The Contractor shall perform the Work in accordance with any decisions of Canada that are made under paragraph 1) of GC2.2 and in accordance with any consequential directions given by Canada.
- 3) If the Contractor fails to comply with any instruction or direction issued by Canada pursuant to the Contract, Canada may employ such methods as Canada deems advisable to do what the Contractor failed to do, and the Contractor shall, on demand, pay Canada an amount that is equal to the aggregate of all costs, expenses and damages incurred or sustained by Canada by reason of the Contractor's failure to comply with such instruction or direction, including the cost of any methods employed by Canada in doing what the Contractor failed to do.

GC2.3 NOTICES

- 1) Subject to paragraph 3) of GC2.3, any notice, order or other communication may be given in any manner, and if required to be in writing, shall be addressed to the party to whom it is intended at the address in the Contract or at the last address of which the sender has received written notice in accordance with this section.
- 2) Any notice, order or other communication given in writing in accordance with paragraph 1) of GC2.3 shall be deemed to have been received by either party
 - (a) if delivered personally, on the day that it was delivered;
 - (b) if forwarded by mail, on the earlier of the day it was received or the sixth day after it was mailed; and
 - (c) if forwarded by facsimile or electronic mail, 24 hours after it was transmitted.
- 3) A notice given under GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS, GC7.2 SUSPENSION OF WORK, and GC7.3 TERMINATION OF CONTRACT shall be given in writing and, if delivered personally, shall be delivered, if the Contractor is a sole proprietor, to the Contractor or, if the Contractor is a partnership or corporation, to an officer thereof.

GC2.4 SITE MEETINGS

- 1) In consultation with Canada, the Contractor shall arrange site meetings at regular intervals, with all involved parties who are to attend, in order to ensure, among other things, the proper co-ordination of the Work.

GC2.5 REVIEW AND INSPECTION OF WORK

- 1) Canada shall review the Work to determine if it is proceeding in conformity with the Contract and to record the necessary data to make an assessment of the value of Work completed. Canada shall measure and record the quantities of labour, Plant and Material performed, used or supplied by the Contractor in performing the Work or any part thereof that is subject to a Unit Price Arrangement and, on request, shall inform the Contractor of those measurements, and permit the Contractor to inspect any records pertaining thereto.
- 2) Canada shall reject Work or Material which in Canada's opinion does not conform to the requirements of the Contract, and shall require inspection or testing of Work, whether or not such Work is fabricated, installed, or completed. If such Work is not in accordance with the

requirements of the Contract, the Contractor shall correct the Work and shall pay Canada, on demand, all reasonable costs and expenses that were incurred by Canada in having the examination performed.

- 3) The Contractor shall provide Canada with access to the Work and its site at all times, and at all times shall provide sufficient, safe, and proper facilities for the review and inspection of the Work by persons authorized by Canada and any representatives of those authorities having jurisdiction. If parts of the Work are in preparation at locations other than the site of the Work, Canada shall be given access to such Work whenever it is in progress.
- 4) The Contractor shall furnish Canada with such information respecting the performance of the Contract as Canada may require, and render every possible assistance to enable Canada to verify that the Work is performed in accordance with the Contract, carry out any other duties and exercise any powers in accordance with the Contract.
- 5) If Work is designated for tests, inspections, or approvals in the Contract or by Canada's instructions, or by laws or ordinances of the place of the Work, the Contractor shall give Canada reasonable notice of when such Work shall be ready for review and inspection. The Contractor shall arrange for and shall give Canada reasonable notice of the date and time of inspections, tests or approvals.
- 6) If the Contractor covers, or permits to be covered, Work that has been designated for tests, inspections or approvals before such tests, inspections or approvals are made, completed or given, the Contractor shall, if so directed by Canada, uncover such Work, have the inspections, tests or approvals satisfactorily made, completed or given and make good the covering of the Work at the Contractor's expense.

GC2.6 SUPERINTENDENT

- 1) Prior to commencing the Work, the Contractor shall designate a Superintendent and shall notify Canada of the name, address and telephone number of the Superintendent. The Contractor shall keep the Superintendent at the Work site during working hours until the Work has reached completion.
- 2) The Superintendent shall be in full charge of the operations of the Contractor during the performance of the Work and shall be authorized to accept on behalf of the Contractor any notice, order or other communication given to the Superintendent or the Contractor relating to the Work.
- 3) Upon request of Canada, the Contractor shall remove any Superintendent who, in the opinion of Canada, is incompetent or has been guilty of improper conduct, and shall forthwith designate another Superintendent who is acceptable to Canada.
- 4) The Contractor shall not substitute a Superintendent without the written consent of Canada. If a Superintendent is substituted without such consent, Canada shall be entitled to refuse to issue any documentation or certification relating to progress payments, Substantial Performance or Completion of the Work until the Superintendent has returned to the Work site or another Superintendent who is acceptable to Canada has been substituted.

GC2.7 NON-DISCRIMINATION IN HIRING AND EMPLOYMENT OF LABOUR

- 1) For the purposes of this clause, "persons" include the Contractor, its subcontractors and suppliers at any tier and their respective employees, agents, licensees or invitees and any other individual involved in the performance of the Work or granted access to the Work site.

A “person” includes any partnership, proprietorship, firm, joint venture, consortium and corporation.

- 2) Without restricting the provisions of paragraph 3) of GC2.6, SUPERINTENDENT, the Contractor shall not refuse to employ and shall not discriminate in any manner against any person because
 - (a) of that person's race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, disability, conviction for which a pardon has been granted, or family status;
 - (b) of the race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, disability, conviction for which a pardon has been granted, or family status of any person having a relationship or association with that person, or
 - (c) a complaint has been made or information has been given in respect of that person relating to an alleged failure by the Contractor to comply with subparagraph (a) or (b).
- 3) Within two working days immediately following receipt of a written complaint pursuant to paragraph 2) of GC2.7, the Contractor shall
 - (a) cause to have issued a written direction to the person or persons named by the complainant to cease all actions that form the basis of the complaint;
 - (b) forward a copy of the complaint to Canada by registered mail or courier service; and
 - (c) when the Labour Conditions are applicable under the circumstances of the complaint, forward a copy of the complaint to HRSDC - Labour to the attention of the appropriate Director as described in the Labour Conditions (“HRSDC - Labour” means the labour component of the federal Department of Human Resources and Social Development).
- 4) Within twenty four (24) hours immediately following receipt of a direction from Canada to do so, the Contractor shall cause to have removed from the site of the Work and from the performance of Work under the Contract, any person or persons whom Canada believes to be in breach of the provisions of paragraph 2) of GC2.7.
- 5) No later than thirty (30) days after receipt of the direction referred to in paragraph 4) of GC2.7, the Contractor shall cause the necessary action to be commenced to remedy the breach described in the direction.
- 6) If a direction is issued pursuant to paragraph 4) of GC2.7, Canada may withhold from monies that are due and payable to the Contractor or setoff pursuant to GC5.9 RIGHT OF SETOFF, whichever is applicable, an amount representing the sum of the costs and payment referred to in paragraph 8) of GC2.7.
- 7) If the Contractor fails to proceed in accordance with paragraph 5) of GC2.7, Canada shall take the necessary action to have the breach remedied, and shall determine all supplementary costs incurred by Canada as a result.
- 8) Canada may make a payment directly to the complainant from monies that are due and payable to the Contractor upon receipt from the complainant of
 - (a) a written award issued pursuant to the federal [Commercial Arbitration Act](#), R.S.C. 1985, c. 17 (2nd Supp.);

- (b) a written award issued pursuant to the Canadian Human Rights Act, R.S.C. 1985, c. H-6;
 - (c) a written award issued pursuant to provincial or territorial human rights legislation; or
 - (d) a judgement issued by a court of competent jurisdiction.
- 9) If Canada is of the opinion that the Contractor has breached any of the provisions of this clause, Canada may take the Work out of the Contractor's hands pursuant to GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS.
- 10) Subject to paragraph 7) of GC3.6 SUBCONTRACTING, the Contractor shall ensure that the provisions of this clause are included in all agreements and contracts entered into as a consequence of the Work.

GC2.8 ACCOUNTS AND AUDITS

- 1) The Contractor shall, in addition to the requirements expressed in paragraph 6) of GC3.4 EXECUTION OF THE WORK, maintain full records of the Contractor's estimated and actual cost of the Work together with all tender calls, quotations, contracts, correspondence, invoices, receipts and vouchers relating thereto, and shall make them available on request to audit and inspection by Canada and the Deputy Receiver General for Canada or by persons designated to act on behalf of either or both of them.
- 2) The Contractor shall allow any of the persons referred to in paragraph 1) of GC2.8 to make copies of and take extracts from any of the records and material, and shall furnish such persons or entities with any information those persons or entities may require from time to time in connection with such records and material.
- 3) The Contractor shall maintain and keep the records intact until the expiration of two years after the date that a Certificate of Completion has been issued or until the expiration of such other period of time as Canada may direct.
- 4) The Contractor shall cause all subcontractors at any tier and all other persons directly or indirectly controlled by or affiliated with the Contractor and all persons directly or indirectly having control of the Contractor to comply with the requirements of this clause as if they were the Contractor.

GC3 EXECUTION AND CONTROL OF THE WORK

- GC3.1 PROGRESS SCHEDULE
- GC3.2 ERRORS AND OMISSIONS
- GC3.3 CONSTRUCTION SAFETY
- GC3.4 EXECUTION OF THE WORK
- GC3.5 MATERIAL
- GC3.6 SUBCONTRACTING
- GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS
- GC3.8 LABOUR
- GC3.9 TRUCK HAULAGE RATES (CANCELLED)
- GC3.10 MATERIAL, PLANT AND REAL PROPERTY BECOME PROPERTY OF CANADA
- GC3.11 DEFECTIVE WORK
- GC3.12 CLEANUP OF SITE
- GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

GC3.1 PROGRESS SCHEDULE

- 1) The Contractor shall
 - (a) prepare and submit to Canada, prior to the submission of the Contractor's first progress claim, a progress schedule in accordance with the requirements set out in the Contract;
 - (b) monitor the progress of the Work relative to the schedule and update the schedule as stipulated by the contract documents;
 - (c) advise Canada of any revisions to the schedule required as the result of any extension of time for completion of the Contract that was approved by Canada; and
 - (d) prepare and submit to Canada, at the time of issuance of a Certificate of Substantial Performance, an update of any schedule clearly showing a detailed timetable that is acceptable to Canada for the completion of any unfinished Work and the correction of all listed defects.

GC3.2 ERRORS AND OMISSIONS

- 1) The Contractor shall report promptly to Canada any errors, discrepancies, or omissions the Contractor may discover when reviewing the contract documents. In making a review, the Contractor does not assume any responsibility to Canada for the accuracy of the review. The Contractor shall not be liable for damage or costs resulting from such errors, discrepancies, or omissions in the contract documents prepared by or on behalf of Canada that the Contractor did not discover.

GC3.3 CONSTRUCTION SAFETY

- 1) Subject to GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS, the Contractor shall be solely responsible for construction safety at the place of the Work and for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work. In any emergency, the Contractor shall either stop the Work, make changes or order extra work to ensure the safety of life and the protection of the Work and neighbouring property.

- 2) Prior to commencing the Work, the Contractor shall notify the authorities having jurisdiction for construction safety at the site of the Work with respect to the intended commencement of the Work, and shall provide such authority with whatever additional information may be required by that authority.

GC3.4 EXECUTION OF THE WORK

- 1) The Contractor shall perform, use or supply and pay for, all labour, Plant, Material, tools, construction machinery and equipment, water, heat, light, power, transportation and other facilities and services necessary for the performance of the Work in accordance with the Contract.
- 2) The Contractor shall, at all times, perform the Work in a proper, diligent and expeditious manner as is consistent with construction industry standards and in accordance with the progress schedule prepared pursuant to GC3.1 PROGRESS SCHEDULE and shall provide sufficient personnel to fulfil the Contractor's obligations in accordance with that schedule.
- 3) Subject to paragraph 4) of GC3.4, the Contractor shall have complete care, custody and control of the Work and shall direct and supervise the Work so as to ensure compliance with the Contract. The Contractor shall be responsible for construction means, methods, techniques, sequences and procedures and for co-ordinating the various parts of the Work.
- 4) When requested in writing by Canada, the Contractor shall make appropriate alterations in the method, Plant or workforce at any time Canada considers the Contractor's actions to be unsafe or damaging to either the Work, existing facilities, persons at the site of the Work or the environment.
- 5) The Contractor shall have sole responsibility for the design, erection, operation, maintenance and removal of temporary structures and other temporary facilities and for the construction methods used in their erection, operation, maintenance and removal. The Contractor shall engage and pay for registered professional engineering personnel, skilled in the appropriate discipline to perform these functions if required by law or by the Contract, and in all cases when such temporary facilities and their methods of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.
- 6) The Contractor shall keep at least one copy of current contract documents, submittals, reports, and records of meetings at the site of the Work, in good order and available to Canada.
- 7) Except for any part of the Work that is necessarily performed away from or off the site of the Work, the Contractor shall confine Plant, storage of Material, and operations of employees to limits indicated by laws, ordinances, permits or the contract documents.

GC3.5 MATERIAL

- 1) Unless otherwise specified in the Contract, all Material incorporated in the Work shall be new.
- 2) Subject to paragraph 3) of GC3.5, if a specified reused, refurbished, or recycled item of Material is not available, the Contractor shall apply to Canada to substitute a similar item for the one specified.
- 3) If Canada agrees that the Contractor's application for substitution of a reused, refurbished or recycled item is warranted, and that the substitute item is of acceptable quality and value to

that specified and is suitable for the intended purpose, Canada may approve the substitution, subject to the following:

- (a) the request for substitution shall be made in writing to Canada and shall be substantiated by information in the form of the manufacturer's literature, samples and other data that may be required by Canada;
- (b) the Contractor shall make the request for substitution in a manner that shall not negatively affect the progress schedule of the Contract and well in advance of the time the item of Material must be ordered;
- (c) substitution of Material shall be permitted only with the prior written approval of Canada, and any substituted items that are supplied or installed without such approval shall be removed from the site of the Work at the expense of the Contractor, and specified items installed at no additional cost to Canada; and
- (d) the Contractor shall be responsible for all additional expenses incurred by Canada, the Contractor, its subcontractors and suppliers at any tier due to the Contractor's use of the substitute.

GC3.6 SUBCONTRACTING

- 1) Subject to the provisions of this clause, the Contractor may subcontract any part of the Work but not the whole of the Work.
- 2) The Contractor shall notify Canada in writing of the Contractor's intention to subcontract.
- 3) A notification referred to in paragraph 2) of GC3.6 shall identify the part of the Work and the Subcontractor with whom the Contractor intends to subcontract.
- 4) Canada may for reasonable cause, object to the intended subcontracting by notifying the Contractor in writing within six (6) days of receipt by Canada of a notification referred to in paragraph 2) of GC3.6.
- 5) If Canada objects to a subcontracting, the Contractor shall not enter into the intended subcontract.
- 6) The Contractor shall not change, nor permit to be changed, a Subcontractor engaged by the Contractor, in accordance with this clause, without the written consent of Canada.
- 7) The Contractor shall ensure that all the terms and conditions of the Contract that are of general application shall be incorporated in every other contract issued as a consequence of the Contract, at whatever tier, except those contracts issued solely to suppliers at any tier for the supply of Plant or Material.
- 8) Neither a subcontracting nor Canada's consent to a subcontracting shall be construed to relieve the Contractor from any obligation under the Contract or to impose any liability upon Canada.

GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS

- 1) Canada reserves the right to send other contractors or workers, with or without Plant and Material, onto the site of the Work.

- 2) When other contractors or workers are sent on to the site of the Work, Canada shall
 - (a) enter into separate contracts, to the extent it is possible, with the other contractors under conditions of contract that are compatible with the conditions of the Contract;
 - (b) ensure that the insurance coverage provided by the other contractors is co-ordinated with the insurance coverage of the Contractor as it affects the Work; and
 - (c) take all reasonable precautions to avoid labour disputes or other disputes arising from the work of the other contractors or workers.
- 3) When other contractors or workers are sent on to the site of the Work, the Contractor shall
 - (a) co-operate with them in the carrying out of their duties and obligations;
 - (b) co-ordinate and schedule the Work with the work of the other contractors and workers;
 - (c) participate with other contractors and workers in reviewing their construction schedules when directed to do so;
 - (d) where part of the Work is affected by or depends upon the work of other contractors or workers for its proper execution, promptly report to Canada in writing and prior to proceeding with that part of the Work, any apparent deficiencies in such work. Failure by the Contractor to so report shall invalidate any claims against Canada by reason of the deficiencies in the work of other contractors or workers except those deficiencies that are not then reasonably discoverable; and
 - (e) when designated as being responsible for construction safety at the place of work in accordance with the applicable provincial or territorial laws, carry out its duties in that role and in accordance with those laws.
- 4) If, when entering into the Contract, the Contractor could not have reasonably foreseen nor anticipated the sending of other contractors or workers on to the site of the Work and provided the Contractor
 - (a) incurs extra expense in complying with the requirements of paragraph 3) of GC3.7; and
 - (b) gives Canada written notice of a claim for that extra expense within thirty (30) days of the date that the other contractors or workers were sent onto the Work or its site;

Canada shall pay the Contractor the cost of the extra labour, Plant and Material that was necessarily incurred, calculated in accordance with GC6.4 DETERMINATION OF PRICE.

GC3.8 LABOUR

- 1) To the extent to which they are available, consistent with proper economy and the expeditious carrying out of the Work, the Contractor shall, in the performance of the Work, employ a reasonable number of persons who have been on active service with the Armed Forces of Canada and have been honourably discharged therefrom.

- 2) The Contractor shall maintain good order and discipline among the Contractor's employees and workers engaged in the Work and shall not employ on the site of the Work anyone not skilled in the tasks assigned.

GC3.9 TRUCK HAULAGE RATES

CANCELLED

GC3.10 MATERIAL, PLANT AND REAL PROPERTY BECOME PROPERTY OF CANADA

- 1) Subject to paragraph 9) of GC1.8 LAWS PERMITS AND TAXES, all Material and Plant and the interest of the Contractor in all real property, licences, powers and privileges purchased, used or consumed by the Contractor for the Work shall, immediately after the time of their purchase, use or consumption be the property of Canada for the purposes of the Work and they shall continue to be the property of Canada
 - (a) in the case of Material, until Canada indicates that the Materials shall not be required for the Work; and
 - (b) in the case of Plant, real property, licences, powers and privileges, until Canada indicates that the interest vested in Canada therein is no longer required for the purposes of the Work.
- 2) Material or Plant, that is the property of Canada by virtue of paragraph 1) of GC3.10, shall not be taken away from the site of the Work nor used nor disposed of except for the purposes of the Work without the written consent of Canada.
- 3) Canada is not liable for loss of nor damage from any cause to the Material or Plant referred to in paragraph 1) of GC3.10, and the Contractor is liable for such loss or damage notwithstanding that the Material or Plant is the property of Canada.

GC3.11 DEFECTIVE WORK

- 1) The Contractor shall promptly remove from the site of the Work and replace or re-execute defective Work whether or not the defective Work has been incorporated in the Work and whether or not the defect is the result of poor workmanship, use of defective Material, or damage through carelessness or other act or omission of the Contractor.
- 2) The Contractor, at the Contractor's expense, shall promptly make good other work destroyed or damaged by such removals or replacements.
- 3) If, in the opinion of Canada, it is not expedient to correct defective Work or Work not performed as provided for in the Contract documents, Canada may deduct from the amount otherwise due to the Contractor the difference in value between the Work as performed and that called for by the contract documents.
- 4) The failure of Canada to reject any defective Work or Material shall not constitute acceptance of the defective Work or Material.

GC3.12 CLEANUP OF SITE

- 1) The Contractor shall maintain the Work and its site in a tidy condition and free from an accumulation of waste material and debris.
- 2) Before the issue of a Certificate of Substantial Performance, the Contractor shall remove waste material and debris, and all Plant and Material not required for the performance of the remaining Work and, unless otherwise stipulated in the Contract Documents, shall cause the Work and its site to be clean and suitable for occupancy by Canada.
- 3) Before the issue of a Certificate of Completion, the Contractor shall remove all surplus Plant and Materials and any waste products and debris from the site of the Work.
- 4) The Contractor's obligations described in paragraphs 1) to 3) of GC3.12 do not extend to waste products and other debris caused by Canada's servants, or by other contractors and workers referred to in GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS.

GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

- 1) Without restricting any warranty or guarantee implied or imposed by law or contained in the Contract, the Contractor shall, at the Contractor's expense
 - (a) rectify and make good any defect or fault that appears in the Work or comes to the attention of Canada with respect to those parts of the Work accepted in connection with the Certificate of Substantial Performance within 12 months from the date of Substantial Performance; and
 - (b) rectify and make good any defect or fault that appears in or comes to the attention of Canada in connection with those parts of the Work described in the Certificate of Substantial Performance within 12 months from the date of the Certificate of Completion.
 - (c) transfer and assign, to Canada, any subcontractor, manufacturer or supplier extended warranties or guarantees implied or imposed by law or contained in the Contract covering periods beyond the 12 months stipulated above. Extended warranties or guarantees referred to herein shall not extend the 12-month period whereby the Contractor, except as may be provided elsewhere in the Contract, must rectify and make good any defect or fault that appears in the Work or comes to the attention of Canada.
 - (d) provide, to Canada prior to the issuance of the Certificate of Completion, a list of all extended warranties and guarantees referred to in paragraph (c) above.
- 2) Canada may direct the Contractor to rectify and make good any defect or fault referred to in paragraph 1) of GC3.13 or covered by any other expressed or implied warranty or guarantee and the Contractor shall rectify and make good such defect within the time stipulated in the direction.
- 3) A direction referred to in paragraph 2) GC3.13 shall be in writing and shall be given to the Contractor in accordance with GC2.3 NOTICES.

GC4 PROTECTIVE MEASURES

GC4.1 PROTECTION OF WORK AND PROPERTY

GC4.2 PRECAUTIONS AGAINST DAMAGE, INFRINGEMENT OF RIGHTS, FIRE AND OTHER HAZARDS

GC4.3 MATERIAL, PLANT AND REAL PROPERTY SUPPLIED BY CANADA

GC4.4 CONTAMINATED SITE CONDITIONS

GC4.1 PROTECTION OF WORK AND PROPERTY

- 1) The Contractor shall protect the Work and its site against loss or damage from any cause and shall similarly protect all Material, Plant and real property under the Contractor's care, custody and control whether or not such Material, Plant and real property are supplied by Canada to the Contractor.
- 2) The Contractor shall provide all facilities necessary for the purpose of maintaining security, and shall assist any person authorized by Canada to inspect or to take security measures in respect of the Work and its site.
- 3) Canada may direct the Contractor to do such things and to perform such work as Canada considers reasonable and necessary to ensure compliance with or to remedy a breach of paragraphs 1) or 2) of GC4.1, and the Contractor, shall comply with such direction.

GC4.2 PRECAUTIONS AGAINST DAMAGE, INFRINGEMENT OF RIGHTS, FIRE AND OTHER HAZARDS

- 1) The Contractor shall do whatever is necessary to ensure that
 - (a) no person, property, right, easement nor privilege is injured, damaged or infringed upon by reasons of the Contractor's activities in performing the Work;
 - (b) pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted nor endangered by the performance or existence of the Work, Material or Plant;
 - (c) fire hazards in or about the site of the Work are eliminated and any fire is promptly extinguished;
 - (d) the health and safety of all persons employed in the performance of the Work is not endangered by the methods nor means of their performance;
 - (e) adequate medical services are available to all persons employed on the Work or its site at all times during the performance of the Work;
 - (f) adequate sanitation measures are taken in respect of the Work and its site; and
 - (g) all stakes, buoys and marks placed on the Work or its site by Canada are protected and are not removed, defaced, altered nor destroyed.
- 2) Canada may direct the Contractor to do such things and to perform such work as Canada considers reasonable and necessary to ensure compliance with or to remedy a breach of paragraph 1) of GC4.2, and the Contractor shall comply with the direction of Canada.

GC4.3 MATERIAL, PLANT AND REAL PROPERTY SUPPLIED BY CANADA

- 1) Subject to paragraph 2) of GC4.3, the Contractor is liable to Canada for any loss of or damage to Material, Plant or real property that is supplied or placed in the care, custody and control of the Contractor by Canada for use in connection with the Contract, whether or not that loss or damage is attributable to causes beyond the Contractor's control.
- 2) The Contractor is not liable to Canada for any loss or damage to Material, Plant or real property referred to in paragraph 1) of GC4.3 if that loss or damage results from and is directly attributable to reasonable wear and tear.
- 3) The Contractor shall not use any Material, Plant or real property supplied by Canada except for the purpose of performing the Contract.
- 4) When the Contractor fails to make good any loss or damage for which the Contractor is liable under paragraph 1) within a reasonable time, Canada may cause the loss or damage to be made good at the Contractor's expense, and the Contractor shall thereupon be liable to Canada for the cost thereof and shall, on demand, pay to Canada an amount equal to that cost.
- 5) The Contractor shall keep records of all Material, Plant and real property supplied by Canada as Canada requires and shall satisfy Canada, when requested, that such Material, Plant and real property are at the place and in the condition in which they ought to be.

GC4.4 CONTAMINATED SITE CONDITIONS

- 1) For the purposes of GC4.4, a contaminated site condition exists when a solid, liquid, gaseous, thermal or radioactive irritant or contaminant, or other hazardous or toxic substance or material, including moulds and other forms of fungi, is present at the site of the Work to an extent that constitutes a hazard, or potential hazard, to the environment, property, or the health or safety of any person.
- 2) If the Contractor encounters a contaminated site condition of which the Contractor is not aware or about which the Contractor has not been advised, or if the Contractor has reasonable grounds to believe that such a site condition exists at the site of the Work, the Contractor shall
 - (a) take all reasonable steps, including stopping the Work, to ensure that no person suffers injury, sickness or death, and that neither property nor the environment is injured or destroyed as a result of the contaminated site condition;
 - (b) immediately notify Canada of the circumstances in writing; and
 - (c) take all reasonable steps to minimize additional costs that may accrue as a result of any work stoppage.
- 3) Upon receipt of a notification from the Contractor, Canada shall promptly determine whether a contaminated site condition exists, and shall notify the Contractor in writing of any action to be taken, or work to be performed, by the Contractor as a result of Canada's determination.
- 4) If the Contractor's services are required by Canada, the Contractor shall follow the direction of Canada with regard to any excavation, treatment, removal and disposal of any polluting substance or material.

- 5) Canada, at Canada's sole discretion, may enlist the services of experts and specialty contractors to assist in determining the existence of, and the extent and treatment of contaminated site conditions, and the Contractor shall allow them access and co-operate with them in the carrying out of their duties and obligations.
- 6) Except as may be otherwise provided for in the Contract, the provisions of GC6.4 DETERMINATION OF PRICE shall apply to any additional work made necessary because of a contaminated site condition.

GC5 TERMS OF PAYMENT

- GC5.1 INTERPRETATION
- GC5.2 AMOUNT PAYABLE
- GC5.3 INCREASED OR DECREASED COSTS
- GC5.4 PROGRESS PAYMENT
- GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK
- GC5.6 FINAL COMPLETION
- GC5.7 PAYMENT NOT BINDING ON CANADA
- GC5.8 CLAIMS AND OBLIGATIONS
- GC5.9 RIGHT OF SETOFF
- GC5.10 ASSESSMENTS AND DAMAGES FOR LATE COMPLETION
- GC5.11 DELAY IN MAKING PAYMENT
- GC5.12 INTEREST ON SETTLED CLAIMS
- GC5.13 RETURN OF SECURITY DEPOSIT

GC5.1 INTERPRETATION

In these Terms of Payment

- 1) The "payment period" means a period of 30 consecutive days or such other longer period as may be agreed between the Contractor and Canada.
- 2) An amount is "due and payable" when it is due and payable by Canada to the Contractor according to GC5.4 PROGRESS PAYMENT, GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK or GC5.6 FINAL COMPLETION.
- 3) An amount is "overdue" when it remains unpaid on the first day following the day upon which it is due and payable.
- 4) The "date of payment" means the date of the negotiable instrument of an amount due and payable by the Receiver General for Canada.
- 5) The "Bank Rate" means the rate of interest established by the Bank of Canada as the minimum rate at which it makes short term advances to members of the Canadian Payments Association.
- 6) The "Average Bank Rate" means the simple arithmetic mean of the Bank Rate in effect at 4:00 p.m. Eastern Time each day during the calendar month which immediately precedes the calendar month in which payment is made.

GC5.2 AMOUNT PAYABLE

- 1) Subject to any other provisions of the Contract, Canada shall pay the Contractor, at the times and in the manner hereinafter set out, the amount by which the amounts payable by Canada to the Contractor in accordance with the Contract exceed the amounts payable by the Contractor to Canada, and the Contractor shall accept that amount as payment in full satisfaction for everything furnished and done by the Contractor in respect of the Work to which the payment relates.
- 2) When making any payment to the Contractor, the failure of Canada to deduct an amount payable to Canada by the Contractor shall not constitute a waiver of the right to do so, or an admission of lack of entitlement to do so in any subsequent payment to the Contractor.

- 3) Should any payment be made by Canada in excess of what is owed to the Contractor for the actual work performed, the Contractor will reimburse Canada the excess immediately, with or without demand, and any amounts outstanding shall bear simple interest at the Average Bank rate plus 3 percent per annum from the date of overpayment until the day prior to the date of repayment by the Contractor.
- 4) No payment other than a payment that is expressly stipulated in the Contract shall be made by Canada to the Contractor for any extra expense or any loss or damage incurred or sustained by the Contractor.

GC5.3 INCREASED OR DECREASED COSTS

- 1) The Contract Amount shall not be increased nor decreased by reason of any increase or decrease in the cost of the Work that is brought about by an increase or decrease in the cost of labour, Plant, Material or any wage adjustment arising pursuant to the Labour Conditions.
- 2) Notwithstanding paragraph 1) of GC5.3, if any change, including a new imposition or repeal, of any tax, customs or other duty, charge, or any similar imposition that is imposed under sales, customs or excise tax legislation of the Government of Canada or any Provincial or Territorial legislation, affects the cost of the Work to the Contractor, and occurs
 - (a) after the date of submission by the Contractor of its bid; or
 - (b) after the date of submission of the last revision, if the Contractor's bid was revised;the Contract Amount shall be adjusted in the manner provided in paragraph 3) of GC5.3.
- 3) If a change referred to in paragraph 2) of GC5.3 occurs, the Contract Amount shall be increased or decreased by an amount established by an examination by Canada of the relevant records of the Contractor referred to in GC2.8 ACCOUNTS AND AUDITS to be the increase or decrease in the cost incurred by the Contractor that is directly attributable to that change.
- 4) For the purpose of paragraph 2) of GC5.3, if a tax is changed after the solicitation closing, but public notice of the change has been given by the Minister of Finance or the corresponding Provincial or Territorial authority before that closing, the change shall be deemed to have occurred before the solicitation closing.
- 5) Notwithstanding paragraphs 2) to 4) of GC5.3, no adjustment to the Contract Amount in respect of the Work or a part thereof shall be made for a change in any imposition referred to in this section that occurs after the date required by the Contract for completion of the Work or that part of the Work.

GC5.4 PROGRESS PAYMENT

- 1) On the expiration of a payment period, the Contractor shall deliver to Canada
 - (a) a written progress claim in a form acceptable to Canada that fully describes any part of the Work that has been completed, and any Material that was delivered to the Work site but not incorporated into the Work, during that payment period, and
 - (b) 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.

- 2) Within 10 days of receipt of a progress claim and statutory declaration from the Contractor, Canada shall inspect, or cause to have inspected, the part of the Work and the Material described in the progress claim, and shall issue a progress report to the Contractor, that indicates the value of the part of the Work and the Material described in the progress claim that, in the opinion of Canada
 - (a) is in accordance with the Contract; and
 - (b) was not included in any other progress report relating to the Contract.
- 3) Subject to GC5.2 AMOUNT PAYABLE, and paragraph 5) of GC5.4, Canada shall pay the Contractor an amount that is equal to
 - (a) 95 percent of the value that is indicated in Canada's progress report if a labour and material payment bond has been furnished by the Contractor; or
 - (b) 90 percent of the value that is indicated in Canada's progress report if a labour and material payment bond has not been furnished by the Contractor.
- 4) Canada shall pay the amount referred to in paragraph 3) of GC5.4 not later than
 - (a) 30 days after receipt by Canada of both a progress claim and a statutory declaration referred to in paragraph 1) of GC5.4; or
 - (b) 15 days after receipt by Canada of the Contractor's progress schedule or updated progress schedule, in accordance with GC3.1 PROGRESS SCHEDULE,whichever is later.
- 5) In the case of the Contractor's first progress claim, it is a condition precedent to Canada's obligation under paragraph 3) of GC5.4 that the Contractor has provided all necessary documentation required by the Contract for the first progress claim.

GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK

- 1) If, at any time before the issuance of a Certificate of Completion, Canada determines that the Work has reached Substantial Performance as described in subparagraph 1) (b) of GC1.1.4 SUBSTANTIAL PERFORMANCE, Canada shall issue a Certificate of Substantial Performance to the Contractor. The Certificate of Substantial Performance shall state or describe
 - (a) the date of Substantial Performance;
 - (b) the parts of the Work not completed to the satisfaction of Canada; and
 - (c) all things that must be done by the Contractor before a Certificate of Completion is issued and before the 12-month warranty period referred to in GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK commences for the said parts and all the said things.

- 2) The issuance of a Certificate of Substantial Performance does not relieve the Contractor from the Contractor's obligations under GC3.11 DEFECTIVE WORK.
- 3) Subject to GC5.2 AMOUNT PAYABLE and paragraph 4) of GC5.5, Canada shall pay the Contractor the amount referred to in paragraph 1) of GC5.2 AMOUNT PAYABLE, less the aggregate of
 - (a) the sum of all payments that were made pursuant to GC5.4 PROGRESS PAYMENT;
 - (b) an amount that is equal to Canada's estimate of the cost to Canada of rectifying defects described in the Certificate of Substantial Performance; and
 - (c) an amount that is equal to Canada's estimate of the cost to Canada of completing the parts of the Work described in the Certificate of Substantial Performance other than defects listed therein.
- 4) Canada shall pay the amount referred to in paragraph 3) of GC5.5 not later than
 - (a) 30 days after the date of issue of a Certificate of Substantial Performance, or
 - (b) 15 days after the Contractor has delivered to Canada
 - (i) a statutory declaration containing a declaration by the Contractor that up to the date of the Certificate of Substantial Performance, the Contractor has complied with all lawful obligations with respect to the Labour Conditions, discharged all its lawful obligations to its Subcontractors and Suppliers in respect of the work under the Contract, and discharged its lawful obligations referred to in GC1.8 LAWS, PERMITS AND TAXES;
 - (ii) evidence of compliance with workers' compensation legislation in accordance with GC1.9 WORKERS' COMPENSATION; and
 - (iii) an update of the progress schedule in accordance with the requirements of GC3.1 PROGRESS SCHEDULE;

whichever is later.

GC5.6 FINAL COMPLETION

- 1) When Canada is of the opinion that the Contractor has complied with the Contract and all orders and directions made pursuant thereto, and that the Work has been completed as described in GC1.1.5 COMPLETION, Canada shall issue a Certificate of Completion to the Contractor and, if the Work or a portion of the Work is subject to a Unit Price Arrangement, Canada shall issue a Certificate of Measurement that shall, subject to GC8, be binding upon and conclusive between Canada and the Contractor as to the quantities referred to therein.
- 2) Subject to GC5.2 AMOUNT PAYABLE and paragraph 3) of GC5.6, Canada shall pay the Contractor the amount referred to in GC5.2 AMOUNT PAYABLE, less the aggregate of the sum of all payments that were made pursuant to GC5.4 PROGRESS PAYMENT and GC5.5 SUBSTANTIAL PERFORMANCE OF WORK.
- 3) Canada shall pay the amount referred to in paragraph 2) of GC5.6 not later than
 - (a) 60 days after the date of issue of a Certificate of Completion; or

- (b) 15 days after the Contractor has delivered to Canada
 - (i) a statutory declaration which contains a declaration by the Contractor that all of the Contractor's lawful obligations and any lawful claims against the Contractor that arose out of the performance of the Contract have been discharged and satisfied; and
 - (ii) evidence of compliance with workers' compensation legislation in accordance with GC1.9 WORKERS' COMPENSATION;

whichever is later.

GC5.7 PAYMENT NOT BINDING ON CANADA

- 1) Neither acceptance of a progress claim or progress report, nor any payment made by Canada under the Contract, nor partial or entire use or occupancy of the Work by Canada shall constitute an acceptance by Canada of any portion of the Work or Material that is not in accordance with the requirements of the Contract.

GC5.8 CLAIMS AND OBLIGATIONS

- 1) The Contractor shall discharge all the Contractor's lawful obligations and shall satisfy all lawful claims against the Contractor arising out of the performance of the Work at least as often as the Contract requires Canada to pay the Contractor.
- 2) Whenever requested to do so by Canada, the Contractor shall make a statutory declaration declaring to the existence and condition of any obligations and claims against the Contractor arising out of the performance of the Work.
- 3) In order to discharge lawful obligations of and satisfy lawful claims against the Contractor or its Subcontractors arising out of the performance of the Contract, Canada may pay an amount that is due and payable to the Contractor directly to the claimant. Such payment is, to the extent of the payment, a discharge of Canada's liability to the Contractor under the Contract and may be deducted from any amount payable to the Contractor under the Contract.
- 4) For the purposes of paragraph 3) of GC5.8, and subject to paragraph 6) of GC5.8, a claim or obligation shall be considered lawful when it is so determined by
 - (a) a court of legal jurisdiction;
 - (b) an arbitrator duly appointed to arbitrate the claim; or
 - (c) the written consent of the Contractor authorizing payment of the claim or obligation.
- 5) If a claim or obligation would have been subject to the provisions of Provincial or Territorial lien legislation or, in the Province of Quebec, the law relating to legal hypothecs had the Contractor been performing the Work for an entity other than Canada
 - (a) such amount as may be paid by Canada pursuant to paragraphs 3) and 4) of GC5.8 shall not exceed the amount that the Contractor would have been obliged to pay had the provisions of such legislation or law been applicable to the Work;

- (b) a claimant need not comply with the provisions of such legislation, setting out the steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which the claimant might have had; and
 - (c) for the purposes of determining the entitlement of a claimant, the notice required by paragraph 8) of GC5.8 shall be deemed to replace the registration or provision of notice after the performance of work as required by any applicable legislation and no claim shall be deemed to have expired, become void or unenforceable by reason of the claimant not commencing any action within the time prescribed by such legislation.
- 6) The Contractor shall, at the request of any claimant, submit to binding arbitration those questions that need to be answered to establish the entitlement of the claimant to payment. The arbitration shall have as parties to it any Subcontractor or Supplier to whom the claimant supplied Material, performed work or rented equipment should such Subcontractor or Supplier wish to be adjoined, and Canada shall not be a party to such arbitration. Subject to any agreement between the Contractor and the claimant, the arbitration shall be conducted in accordance with the governing Provincial or Territorial legislation applicable to the site of the Work.
- 7) Paragraph 3) of GC5.8 shall apply only to claims and obligations
- (a) the notification of which has set forth the amount claimed to be owing and the person who by contract is primarily liable and has been received by Canada in writing before final payment is made to the Contractor pursuant to GC5.6 FINAL COMPLETION, and within 120 days of the date on which the claimant
 - (i) should have been paid in full under the claimant's contract with the Contractor, its Subcontractor or Supplier if the claim is for money that was lawfully required to be held back from the claimant; or
 - (ii) performed the last of the services, work or labour, or furnished the last of the Material pursuant to the claimant's contract with the Contractor or its Subcontractor or Supplier where the claim is for money not lawfully required to be held back from the claimant; and
 - (b) the proceedings to determine the right to payment of which, pursuant to paragraph 5) of GC5.8, shall have commenced within one year from the date that the notification required by subparagraph 7)(a) of GC5.8 was received by Canada.
- 8) Upon receipt of a notice of claim, Canada may withhold, from any amount that is due and payable to the Contractor pursuant to the Contract, the full amount of the claim or any portion thereof.
- 9) Canada shall notify the Contractor in writing in a timely manner of receipt of any claim and of the intention of Canada to withhold funds. At any time thereafter and until payment is made to the claimant, the Contractor may be entitled to post, with Canada, security in a form acceptable to Canada in an amount equal to the value of the claim, and upon receipt of such security Canada shall release to the Contractor any funds that would be otherwise payable to the Contractor, that were withheld pursuant to the provisions of this clause in respect of the claim of any claimant for whom the security stands.

GC5.9 RIGHT OF SETOFF

- 1) Without limiting any right of setoff or deduction given or implied by law or elsewhere in the Contract, Canada may set off any amount payable to Canada by the Contractor under the

Contract, or under any current contract, against any amount payable to the Contractor under the Contract.

- 2) For the purposes of paragraph 1) of GC5.9, "current contract" means a contract between Canada and the Contractor
 - (a) under which the Contractor has an undischarged obligation to perform or supply work, labour or material; or
 - (b) in respect of which Canada has, since the date of the Contract, exercised any right to take the work that is the subject of that contract out of the Contractor's hands.

GC5.10 ASSESSMENTS AND DAMAGES FOR LATE COMPLETION

- 1) For the purposes of this clause
 - (a) the Work shall be deemed to be completed on the date of the Certificate of Completion; and
 - (b) the "period of delay" means the number of days commencing on the day fixed for completion of the Work and ending on the day immediately preceding the day on which the Work is completed but does not include any day within a period of extension granted pursuant to GC6.5 DELAYS AND EXTENSION OF TIME and any other day on which, in the opinion of Canada, completion of the Work was delayed for reasons beyond the control of the Contractor.
- 2) If the Contractor does not complete the Work by the day fixed for its completion but completes it thereafter, the Contractor shall pay Canada an amount equal to the aggregate of
 - (a) all salaries, wages and travelling expenses incurred by Canada in respect of persons overseeing the performance of the Work during the period of delay;
 - (b) the cost incurred by Canada as a result of the inability to use the completed Work for the period of delay; and
 - (c) all other expenses and damages incurred or sustained by Canada during the period of delay as a result of the Work not being completed by the day fixed for its completion.
- 3) Canada may waive the right of Canada to the whole or any part of the amount payable by the Contractor pursuant to paragraph 2) of GC5.10 if, in the opinion of Canada, it is in the public interest to do so.

GC5.11 DELAY IN MAKING PAYMENT

- 1) Notwithstanding GC1.5 TIME OF THE ESSENCE, any delay by Canada in making any payment when it is due pursuant to GC5 TERMS OF PAYMENT, shall not be a breach of the Contract by Canada.
- 2) Subject to paragraph 3) of GC5.11, Canada shall pay to the Contractor simple interest at the Average Bank Rate plus 3 percent per annum on any amount that is overdue pursuant to paragraph 3) of GC5.1 INTERPRETATION, and the interest shall apply from and include the day such amount became overdue until the day prior to the date of payment.

- 3) Interest shall be paid without demand by the Contractor except that
 - (a) in respect of amounts that are less than 15 days overdue, no interest shall be paid in respect of payment made within such 15 days unless the Contractor so demands after such amounts have become due and payable; and
 - (b) interest shall not be payable or paid on overdue advance payments, if any.

GC5.12 INTEREST ON SETTLED CLAIMS

- 1) For the purposes of this clause, a claim means a disputed amount subject to negotiation between Canada and the Contractor under the Contract.
- 2) A claim is deemed to have been settled when an agreement in writing is signed by Canada and the Contractor setting out the amount of the claim to be paid by Canada and the items of work for which the said amount is to be paid.
- 3) A settled claim is deemed to be outstanding from the day immediately following the date the said claim would have been due and payable under the Contract had it not been disputed.
- 4) Canada shall pay to the Contractor simple interest on the amount of a settled claim at the Average Bank Rate plus 3 percent per annum from the date the settled claim was deemed to be outstanding until the day prior to the date of payment.

GC5.13 RETURN OF SECURITY DEPOSIT

- 1) After a Certificate of Substantial Performance has been issued, and if the Contractor is not in breach of nor in default under the Contract, Canada shall return to the Contractor all or any part of a Security Deposit that, in the opinion of Canada, is not required for the purposes of the Contract.
- 2) After a Certificate of Completion has been issued, Canada shall return to the Contractor the remainder of any security deposit unless the Contract stipulates otherwise.
- 3) If the security deposit was paid into the Consolidated Revenue Fund of Canada, Canada shall pay interest thereon to the Contractor at a rate established pursuant to section 21(2) of the [*Financial Administration Act \(FAA\)*](#).

GC6 DELAYS AND CHANGES IN THE WORK

- GC6.1 CHANGES IN THE WORK
- GC6.2 CHANGES IN SUBSURFACE CONDITIONS
- GC6.3 HUMAN REMAINS, ARCHAEOLOGICAL REMAINS AND ITEMS OF HISTORICAL OR SCIENTIFIC INTEREST
- GC6.4 DETERMINATION OF PRICE
 - GC6.4.1 Price Determination Prior to Undertaking Changes
 - GC6.4.2 Price Determination Following Completion of Changes
 - GC6.4.3 Price Determination - Variations in Tendered Quantities
- GC6.5 DELAYS AND EXTENSION OF TIME

GC6.1 CHANGES IN THE WORK

- 1) At any time before issuance of a Certificate of Completion, Canada may issue orders for additions, deletions or other changes to the Work, or changes in the location or position of the whole or any part of the Work, if the addition, deletion, change or other revision is deemed by Canada to be consistent with the general intent of the Contract.
- 2) An order referred to in paragraph 1) of GC6.1 shall be in writing and given to the Contractor in accordance with GC2.3 NOTICES.
- 3) Upon receipt of an order, the Contractor shall promptly perform the work in accordance with the order as if the order had appeared in and been part of the original Contract.
- 4) If anything done or omitted by the Contractor pursuant to an order increases or decreases the cost of the Work to the Contractor, payment for the work shall be made in accordance with GC6.4 DETERMINATION OF PRICE.

GC6.2 CHANGES IN SUBSURFACE CONDITIONS

- 1) If, during the performance of the Work, the Contractor encounters subsurface conditions that are substantially different from the subsurface conditions described in the tender documents supplied to the Contractor, or a reasonable assumption of fact based thereon, the Contractor shall give notice to Canada immediately upon becoming aware of the situation.
- 2) If the Contractor is of the opinion that the Contractor may incur or sustain any extra expense or any loss or damage that is directly attributable to the changed subsurface conditions, the Contractor shall within 10 days of the date the changed subsurface conditions were encountered, give Canada written notice of intention to claim for that extra expense, loss or damage.
- 3) If the Contractor has given a notice referred to in paragraph 2) of GC6.2, the Contractor shall give Canada a written claim for extra expense, loss or damage no later than 30 days after the date that a Certificate of Substantial Performance is issued.
- 4) A written claim referred to in paragraph 3) of GC6.2 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable Canada to determine whether or not the claim is justified, and the Contractor shall supply such further and other information for that purpose as Canada requires.
- 5) If Canada determines that a claim referred to in paragraph 3) of GC6.2 is justified, Canada shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC6.4 DETERMINATION OF PRICE.

- 6) If, in the opinion of Canada, the Contractor effects a saving of expenditure that is directly attributable to a substantial difference between the information relating to subsurface conditions at the site of the Work that is contained in the tender documents, or a reasonable assumption of fact based thereon, and the actual subsurface conditions encountered by the Contractor, the Contract Amount shall be reduced by the amount of the saving of expenditure determined in accordance with GC6.4 DETERMINATION OF PRICE.
- 7) If the Contractor fails to give a notice referred to in paragraph 2) of GC6.2 and a claim referred to in paragraph 3) of GC6.2 within the times stipulated, an extra payment shall not be made to the Contractor in respect of the occurrence.
- 8) Canada does not warrant the content expressed in any subsurface report available for the perusal of the Contractor that does not form part of the tender and contract documents.

GC6.3 HUMAN REMAINS, ARCHAEOLOGICAL REMAINS AND ITEMS OF HISTORICAL OR SCIENTIFIC INTEREST

- 1) For the purposes of this clause
 - (a) "human remains" means the whole or any part of a deceased human being, irrespective of the time of death;
 - (b) "archaeological remains" are items, artefacts or things made, modified or used by human beings in antiquity and may include, but not be limited to, stone, wood or iron structures or monuments, dump deposits, bone artefacts, weapons, tools, coins, and pottery; and
 - (c) "items of historical or scientific interest" are naturally occurring or manufactured objects or things of any age that are not archaeological remains but may be of interest to society because of their historical or scientific significance, value, rarity, natural beauty, or other quality.
- 2) If, during the course of the Work, the Contractor encounters any object, item or thing which is described in paragraph 1) of GC6.3 or which resembles any object, item or thing described in paragraph 1) of GC6.3, the Contractor shall
 - (a) take all reasonable steps, including stopping work in the affected area, to protect and preserve the object, item or thing;
 - (b) immediately notify Canada of the circumstances in writing; and
 - (c) take all reasonable steps to minimize additional costs that may accrue as a result of any work stoppage.
- 3) Upon receipt of a notification in accordance with subparagraph 2)(b) of GC6.3, Canada shall promptly determine whether the object, item or thing is one described in, or contemplated by paragraph 1) of GC6.3, and shall notify the Contractor in writing of any action to be performed, or work to be carried out, by the Contractor as a result of Canada's determination.
- 4) Canada may, at any time, enlist the services of experts to assist in the investigation, examination, taking of measurements or other such recordings, placing of permanent protection around or removing of the object, item or thing encountered by the Contractor, and the Contractor shall, to the satisfaction of Canada, allow them access and co-operate with them in the carrying out of their duties and obligations.

- 5) Human remains, archaeological remains and items of historical or scientific interest encountered at the site of the Work shall be deemed to be the property of Canada.
- 6) Except as may be otherwise provided for in the Contract, the provisions of GC6.4 DETERMINATION OF PRICE and GC6.5 DELAYS AND EXTENSION OF TIME shall apply.

GC6.4 DETERMINATION OF PRICE

GC6.4.1 Price Determination Prior to Undertaking Changes

- 1) If a Lump Sum Arrangement applies to the Contract or a part thereof, the price of any change shall be the aggregate estimated cost of labour, Plant and Material that is required for the change as agreed upon in writing by the Contractor and Canada plus a negotiated allowance for supervision, co-ordination, administration, overhead, margin and the risk of undertaking the work within the stipulated amount.
- 2) If a Unit Price Arrangement applies to the Contract or a part thereof, the Contractor and Canada may, by agreement in writing, add items, units of measurement, estimated quantities and prices per unit to the Unit Price Table.
- 3) A price per unit referred to in paragraph 2) of GC6.4.1 shall be determined on the basis of the aggregate estimated cost of labour, Plant and Material that is required for the additional item as agreed upon by the Contractor and Canada, plus a negotiated allowance.
- 4) To facilitate approval of the price of the change or the additional price per unit as applicable, the Contractor shall submit a cost estimate breakdown identifying, as a minimum, the estimated cost of labour, Plant, Material, each subcontract amount, and the amount of the negotiated allowance.
- 5) If no agreement is reached as contemplated in paragraph 1) of GC6.4.1, the price shall be determined in accordance with GC6.4.2.
- 6) If no agreement is reached, as contemplated in paragraphs 2) and 3) of GC6.4.1, Canada shall determine the class and the unit of measurement of the item of labour, Plant or Material and the price per unit shall be determined in accordance with GC6.4.2.

GC6.4.2 Price Determination Following Completion of Changes

- 1) If it is not possible to predetermine, or if there is failure to agree upon the price of a change in the Work, the price of the change shall be equal to the aggregate of
 - (a) all reasonable and proper amounts actually expended or legally payable by the Contractor in respect of the labour, Plant and Material that fall within one of the classes of expenditure described in paragraph 2) of GC6.4.2, that are directly attributable to the performance of the Contract;
 - (b) an allowance for profit and all other expenditures or costs, including overhead, general administration costs, financing and interest charges, in an amount that is equal to 10 percent of the sum of the expenses referred to in subparagraph 1)(a) of GC6.4.2; and
 - (c) interest on the amounts determined under subparagraphs 1)(a) and 1)(b) of GC6.4.2 calculated in accordance with GC5.12 INTEREST ON SETTLED CLAIMS;

- 2) The cost of labour, Plant and Material referred to in subparagraph 1)(a) of GC6.4.2 shall be limited to the following categories of expenditure:
- (a) payments to Subcontractors and Suppliers;
 - (b) wages, salaries, bonuses and, if applicable, travel and lodging expenses of employees of the Contractor located at the site of the Work and that portion of wages, salaries, bonuses and, if applicable, travel and lodging expenses of personnel of the Contractor generally employed at the head office or at a general office of the Contractor provided they are actually and properly engaged on the Work under the Contract;
 - (c) assessments payable under any statutory authority relating to workers' compensation, employment insurance, pension plan or holidays with pay, provincial health or insurance plans, environmental reviews, and Applicable Taxes collection costs;
 - (d) rent that is paid for Plant, or an amount equivalent to the said rent if the Plant is owned by the Contractor, that is necessary for and used in the performance of the Work, if the rent or the equivalent amount is reasonable and use of that Plant has been approved by Canada;
 - (e) payments for maintaining and operating Plant necessary for and used in the performance of the Work, and payments for effecting repairs thereto that, in the opinion of Canada, are necessary for the proper performance of the Contract, other than payments for any repairs to the Plant arising out of defects existing before its allocation to the Work;
 - (f) payments for Material that is necessary for and incorporated in the Work, or that is necessary for and consumed in the performance of the Contract;
 - (g) payments for preparation, delivery, handling, erection, installation, inspection, protection and removal of the Plant and Material necessary for and used in the performance of the Contract; and
 - (h) any other payments made by the Contractor with the approval Canada that are necessary for the performance of the Contract in accordance with the Contract Documents.

GC6.4.3 Price Determination - Variations in Tended Quantities

- 1) Except as provided in paragraphs 2), 3), 4) and 5) of GC6.4.3, if it appears that the final quantity of labour, Plant and Material under a price per unit item shall exceed or be less than the estimated tendered quantity, the Contractor shall perform the Work or supply the Plant and Material required to complete the item and payment shall be made for the actual Work performed or Plant and Material supplied at the price per unit set out in the Contract.
- 2) If the final quantity of the price per unit item exceeds the estimated tendered quantity by more than 15 percent, either party to the Contract may make a written request to the other party to negotiate an amended price per unit for that portion of the item which exceeds 115 percent of the estimated tendered quantity, and to facilitate approval of any amended price per unit, the Contractor shall, on request, provide Canada with
- (a) detailed records of the actual cost to the Contractor of performing or supplying the tendered quantity for the price per unit item up to the time the negotiation was requested; and

- (b) the estimated unit cost of labour, Plant and Material required for the portion of the item that is in excess of 115 percent of the tendered quantity.
- 3) If agreement is not reached as contemplated in paragraph 2) of GC6.4.3, the price per unit shall be determined in accordance with GC6.4.2.
 - 4) If it appears that the final quantity of labour, Plant and Material under a price per unit item shall be less than 85 percent of the estimated tendered quantity, either party to the Contract may make a written request to the other party to negotiate a change to the price per unit for the item if
 - (a) there is a demonstrable difference between the unit cost to the Contractor of performing or supplying the estimated tendered quantity and the unit cost to the Contractor for performing or supplying the final quantity; and
 - (b) the difference in unit cost is due solely to the decrease in quantity and not to any other cause.
 - 5) For the purposes of the negotiation referred to in paragraph 4) of GC6.4.3
 - (a) the onus of establishing, justifying and quantifying a proposed change lies with the party making the request for negotiation; and
 - (b) in no event shall the total price for an item that has been amended as a result of a reduction in quantity pursuant to paragraph 4) of GC6.4.3 exceed the amount that would have been payable to the Contractor had 85 percent of the tendered quantity actually been performed or supplied.

GC6.5 DELAYS AND EXTENSION OF TIME

- 1) Upon application of the Contractor made before the date first fixed for completion of the Work or before any other date previously fixed under this clause, Canada may extend the time for completion of the Work by fixing a new date if Canada determines that causes beyond the control of the Contractor have delayed its completion.
- 2) The Contractor's application shall be accompanied by the written consent of the bonding company whose bond forms part of the Contract Security.
- 3) Subject to paragraph 4) of GC6.5, no payment, other than a payment that is expressly stipulated in the Contract, shall be made by Canada to the Contractor for any extra expense, loss or damage incurred or sustained by the Contractor due to delay, whether or not the delay is caused by circumstances beyond the control of the Contractor.
- 4) If the Contractor incurs or sustains any extra expense or any loss or damage that is directly attributable to any neglect or delay that occurs after the date of the Contract on the part of Canada in providing any information or in doing any act that the Contract either expressly requires Canada to do or that would ordinarily be done by an owner in accordance with the practice of the trade, the Contractor shall give Canada written notice of intention to claim for that extra expense or loss or damage within ten working days of the date the neglect or delay first occurred.
- 5) When the Contractor has given a notice referred to in paragraph 4) of GC6.5, the Contractor shall give Canada a written claim for the extra expense, loss or damage no later than 30 days after the date that a Certificate of Completion is issued and not afterwards.

- 6) A written claim referred to in paragraph 5) of GC6.5 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable Canada to determine whether or not the claim is justified and the Contractor shall supply such further and other information for that purpose as Canada may require.
- 7) If Canada determines that a claim referred to in paragraph 5) of GC6.5 is justified, Canada shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC6.4 DETERMINATION OF PRICE.
- 8) If the Contractor fails to give a notice referred to in paragraph 4) and a claim referred to in paragraph 5) of GC6.5 within the times stipulated, an extra payment shall not be made to the Contractor in respect of the occurrence.

GC7 DEFAULT, SUSPENSION OR TERMINATION OF CONTRACT

GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS

GC7.2 SUSPENSION OF WORK

GC7.3 TERMINATION OF CONTRACT

GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN

GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS

- 1) By giving notice in writing to the Contractor in accordance with GC2.3 NOTICES, Canada, without any other authorization, may take all or any part of the Work out of the Contractor's hands, and may employ such means as Canada sees fit to have the Work completed if the Contractor:
 - (a) fails to remedy any delay in the commencement or default in the diligent performance of the Work to the satisfaction of Canada within six days of Canada giving notice to the Contractor in writing in accordance with GC2.3 NOTICES;
 - (b) defaults in the completion of any part of the Work within the time fixed for its completion by the Contract;
 - (c) becomes insolvent, or has committed an act of bankruptcy, and has neither made a proposal to its creditors nor filed a notice of intention to make such a proposal, pursuant to the [*Bankruptcy and Insolvency Act*](#);
 - (d) abandons the work;
 - (e) makes an assignment of the Contract without the consent required by GC1.16 ASSIGNMENT; or
 - (f) otherwise fails to observe or perform any of the provisions of the Contract.
- 2) If the whole or any part of the Work is taken out of the Contractor's hands, the Contractor's right to any further payment that is due or accruing due under the Contract is, subject only to paragraph 3) of GC7.1, extinguished, and the Contractor is liable to pay Canada, upon demand, an amount that is equal to the amount of all loss and damage incurred or sustained by Canada in respect of the Contractor's failure to complete the Work.
- 3) If the whole or any part of the Work that is taken out of the Contractor's hands is completed by Canada, Canada may pay the Contractor the amount, if any, of the holdback or a progress claim as determined by Canada that had accrued and was due prior to the date on which the Work was taken out of the Contractor's hands and that is not required for the purposes of having the Work performed or of compensating Canada for any other loss or damage incurred or sustained by reason of the Contractor's default.
- 4) The taking of the Work or any part thereof out of the Contractor's hands does not relieve the Contractor from any obligation under the Contract or imposed by law except the obligation to complete the performance of that part of the Work that was taken out of the Contractor's hands.
- 5) If the Work or any part thereof is taken out of the Contractor's hands, all Plant and Material and the interest of the Contractor, or its suppliers or subcontractors at any tier, in all real property, licences, powers and privileges acquired, used or provided by the Contractor, or its suppliers or subcontractors at any tier, under the Contract shall continue to be the property of Canada without compensation.

- 6) When Canada certifies that any Plant, Material, or any interest of the Contractor is no longer required for the purposes of the Work, or that it is not in the interests of Canada to retain that Plant, Material, or interest, it shall revert to the Contractor.
- 7) If the Contractor has become insolvent or has committed an act of bankruptcy, and has either made a proposal to its creditors or filed a notice of intention to make such a proposal, pursuant to the Bankruptcy and Insolvency Act, the Contractor shall immediately forward a copy of the proposal or the notice of intention to Canada.

GC7.2 SUSPENSION OF WORK

- 1) When, in Canada's opinion, it is in the public interest to do so, Canada may require the Contractor to suspend performance of the Work either for a specified or an unspecified period, by giving a notice of suspension in writing to the Contractor in accordance with GC2.3 NOTICES.
- 2) When a notice of suspension is received by the Contractor, the Contractor shall suspend all operations in respect of the Work except those that Canada determines are necessary for the care and preservation of the Work, Plant and Material.
- 3) During a period of suspension, the Contractor shall not remove any part of the Work, Plant or Material from its site without the consent of Canada.
- 4) If a period of suspension is 60 days or less, the Contractor shall resume the performance of the Work on the expiration of that period, and the Contractor is entitled to be paid the extra costs necessarily incurred by the Contractor as a result of the suspension, determined in accordance with GC6.4 DETERMINATION OF PRICE.
- 5) If a period of suspension is more than 60 days, Canada and the Contractor may agree that the performance of the Work shall be continued by the Contractor, and the Contractor shall resume performance of the Work subject to any terms and conditions agreed upon by Canada and the Contractor. If Canada and the Contractor do not agree that performance of the Work shall be continued by the Contractor, or upon the terms and conditions under which the Contractor shall continue the Work, the notice of suspension shall be deemed to be a notice of termination pursuant to GC7.3 TERMINATION OF CONTRACT.

GC7.3 TERMINATION OF CONTRACT

- 1) Canada may terminate the Contract at any time by giving a notice of termination in writing to the Contractor in accordance with GC2.3 NOTICES.
- 2) If the Contractor receives a notice of termination, the Contractor shall forthwith cease all operations in performance of the Contract, subject to any conditions stipulated in the notice.
- 3) Subject to paragraph 4) of GC7.3, if the Contract is terminated, Canada shall pay the Contractor an amount determined to be due to the Contractor pursuant to GC6.4 DETERMINATION OF PRICE less the aggregate of all amounts that were paid to the Contractor by Canada and all amounts that are due to Canada from the Contractor pursuant to the Contract.
- 4) In no event shall the total amount payable by Canada to the Contractor exceed the amount, calculated in accordance with GC5 TERMS OF PAYMENT, that would have been payable to the Contractor had the Contractor completed the Work.

- 5) Payment to the Contractor, if any, shall be made as soon as practicable under the circumstances.

GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN

- 1) If the Work is taken out of the Contractor's hands, or the Contractor is in breach of, or in default under, the Contract, Canada may convert a security deposit to Canada's own use.
- 2) If Canada converts a security deposit, the amount realized shall be deemed to be an amount due from Canada to the Contractor under the Contract.
- 3) Any balance of the amount realized that remains after payment of all losses, damage and claims of Canada and others shall be paid by Canada to the Contractor if, in the opinion of Canada, it is not required for the purposes of the Contract.

GC8 DISPUTE RESOLUTION

- GC8.1 INTERPRETATION
- GC8.2 CONSULTATION AND CO-OPERATION
- GC8.3 NOTICE OF DISPUTE
- GC8.4 NEGOTIATION
- GC8.5 MEDIATION
- GC8.6 CONFIDENTIALITY
- GC8.7 SETTLEMENT
- GC8.8 RULES FOR MEDIATION OF DISPUTES
 - GC8.8.1 Interpretation
 - GC8.8.2 Application
 - GC8.8.3 Communication
 - GC8.8.4 Appointment of Project Mediator
 - GC8.8.5 Confidentiality
 - GC8.8.6 Time and Place of Mediation
 - GC8.8.7 Representation
 - GC8.8.8 Procedure
 - GC8.8.9 Settlement Agreement
 - GC8.8.10 Termination of Mediation
 - GC8.8.11 Costs
 - GC8.8.12 Subsequent Proceedings

GC8.1 INTERPRETATION

- 1) "dispute" means any disagreement regarding any issue identified by the Contractor in the notice submitted to Canada in accordance with paragraph 2 of GC8.3 NOTICE OF DISPUTE, and includes any claim by the Contractor arising from such disagreement and any counterclaim by Canada, but does not include any claim by either party for punitive or exemplary damages, injury to persons, death, or any claim based on an allegation of libel or slander.
- 2) The alternative dispute resolution procedures set out in GC8, do not apply to any claim by Canada against the Contractor except any counterclaim in a dispute as defined in paragraph 1 of GC8.1, including, but not limited to, any claim of setoff regarding any amount due to Canada under GC5.10 ASSESSMENT AND DAMAGES FOR LATE COMPLETION.

GC8.2 CONSULTATION AND CO-OPERATION

- 1) The parties agree to maintain open and honest communication throughout the performance of the Contract.
- 2) The parties agree to consult and co-operate with each other in the furtherance of the Work and the resolution of problems or differences that may arise.

GC8.3 NOTICE OF DISPUTE

- 1) Any difference between the parties to the Contract of any nature arising out of or in connection with the Contract which could result in a claim by the Contractor against Canada, and which is not settled by consultation and co-operation as envisaged in GC8.2 CONSULTATION AND CO-OPERATION, shall be resolved in the first instance by Canada, whose written decision or direction shall be final and binding subject only to the provisions of

GC8. Such written decision or direction includes, but is not limited to, any written decision or direction by Canada under any provision of the General Conditions.

- 2) The Contractor shall be deemed to have accepted the decision or direction of Canada referred to in paragraph 1) of GC8.3 and to have expressly waived and released Canada from any claim in respect of the particular matter dealt with in that decision or direction unless, within 15 working days after receipt of the decision or direction, the Contractor submits to Canada a written notice of dispute requesting formal negotiation under GC8.4 NEGOTIATION. Such notice shall refer specifically to GC8.4 NEGOTIATION, and shall specify the issues in contention and the relevant provisions of the Contract.
- 3) The giving of a written notice in accordance with paragraph 2) of GC8.3 shall not relieve the Contractor from complying with the decision or direction that is the subject of the dispute. Such compliance, however, shall not be construed as an admission by the Contractor of the correctness of such decision or direction.
- 4) If a dispute is not resolved promptly, Canada shall give such instructions as, in Canada's opinion, are necessary for the proper performance of the Work and to prevent delays pending a resolution of the matter. Unless Canada terminates the Contract, orders the Contractor to suspend the Work, or takes the Work out of the hands of the Contractor, the Contractor shall continue to perform the Work in accordance with the provisions and requirements of the Contract and the instructions of Canada. Such performance shall not prejudice any claim that the Contractor may have.
- 5) Nothing in GC8 relieves the Contractor from its obligation to provide any other notice required by the Contract within the time specified in the Contract, including but not limited to, any notice required under GC6.2 CHANGES IN SUBSURFACE CONDITIONS.

GC8.4 NEGOTIATION

- 1) Within 10 working days after receipt by Canada of a notice referred to in paragraph 2) of GC8.3 NOTICE OF DISPUTE, or within such other period of time as may be mutually agreed to, the parties shall commence formal negotiations in order to resolve the dispute. Negotiations shall occur initially between representatives of the Contractor and Canada who play a direct supervisory role in the performance, administration or management of the Contract.
- 2) If the representatives referred to in paragraph 1) of GC8.4 are unable to resolve some or all of the issues which are the subject of the negotiations within 10 working days, the parties shall refer the remaining issues which are in dispute to a second level of negotiation between a principal or principals of the Contractor and a senior level manager or senior level managers representing Canada.
- 3) If negotiations fail to resolve the dispute within 30 working days from the date of delivery of the notice referred to in paragraph 2) of GC8.3 NOTICE OF DISPUTE, or within such longer period as may have been agreed to by the parties, the Contractor may, by giving written notice to Canada, in accordance with GC2.3 NOTICES, within 10 working days from the end of such period, request that mediation be undertaken to assist the parties to reach agreement on the outstanding issues.
- 4) If the Contractor does not request mediation within the period permitted by paragraph 3) of GC8.4, the Contractor shall be deemed to have accepted the decision or direction of Canada under paragraph 1) of GC8.3 NOTICE OF DISPUTE and to have expressly waived and released Canada from any claim in respect of the particular matter dealt with in that decision or direction.

GC8.5 MEDIATION

- 1) If the Contractor has requested mediation in accordance with paragraph 3) of GC8.4 NEGOTIATION, mediation shall be conducted in accordance with GC8.8 RULES FOR MEDIATION OF DISPUTES.
- 2) If a Project Mediator has not previously been appointed for the purposes of the Contract, a Project Mediator shall be appointed in accordance with GC8.8 RULES FOR MEDIATION OF DISPUTES forthwith after delivery of a notice in accordance with paragraph 3) of GC8.4 NEGOTIATION, requesting mediation.
- 3) If the dispute has not been resolved within
 - (a) Ten (10) working days following the appointment of a Project Mediator in accordance with paragraph 2) of GC8.5, if a Project Mediator was not previously appointed;
 - (b) Ten (10) working days following receipt by Canada of a written notice in accordance with paragraph 3) of GC8.4 NEGOTIATION, if a Project Mediator was previously appointed; or
 - (c) such other longer period as may have been agreed to by the parties;the Project Mediator shall terminate the mediation by giving written notice to the parties stating the effective date of termination.

GC8.6 CONFIDENTIALITY

- 1) All information exchanged during alternative dispute resolution procedures, by whatever means, shall be without prejudice and shall be treated as confidential by the parties and their representatives, unless otherwise required by law. However, evidence that is independently admissible or discoverable shall not be rendered inadmissible or non-discoverable by virtue of its use during an alternative dispute resolution process.

GC8.7 SETTLEMENT

- 1) Any agreement to settle all or any part of a dispute, by whatever means, shall be in writing and be signed by the parties or their authorized representatives.

GC8.8 RULES FOR MEDIATION OF DISPUTES

GC8.8.1 Interpretation

In these Rules

- 1) “Coordinator” means the person designated by Canada to act as the Dispute Resolution Coordinator.

GC8.8.2 Application

- 1) By mutual agreement, the parties may change or make additions to the Rules.

GC8.8.3 Communication

- 1) Written communications pursuant to these Rules shall be given in accordance with GC2.3 NOTICES.

GC8.8.4 Appointment of Project Mediator

- 1) The parties to the Contract may, by mutual consent, at any time after entry into the Contract, appoint a mediator (the "Project Mediator") to conduct mediation proceedings in accordance with these Rules for Mediation of Disputes, in regard to any dispute that may arise with regard to the interpretation, application or administration of the Contract. In this case, they shall jointly enter into a contract with the appointed Project Mediator, which contract shall be in a form drafted by the Coordinator and agreed to by the parties.
- 2) If the parties do not appoint a Project Mediator pursuant to paragraph 1) of GC8.8.4, the parties shall appoint a Project Mediator within 17 working days following receipt of a written notice from the Contractor, in accordance with GC2.3 NOTICES, requesting that mediated negotiations be undertaken in accordance with these Rules to assist the parties to reach agreement on any outstanding issues that may be in dispute. Any contract entered into with the appointed Project Mediator shall meet the requirements as set out for the contract described in paragraph 1) of GC8.8.4.
- 3) When mediation is requested by the Contractor pursuant to paragraph 3) of GC8.4 NEGOTIATION, if the parties have previously entered into a contract with a Project Mediator, the parties shall within 2 days send to both the Project Mediator and the Coordinator
 - (a) a copy of the notice requesting negotiation under paragraph 2) of GC8.3 NOTICE OF DISPUTE;
 - (b) a copy of Canada's written position in relation to the notice, the issues in contention and the relevant provisions of the contract; and
 - (c) a copy of the Contractor's written request for mediation required under paragraph 3) of GC8.4 NEGOTIATION.
- 4) If the parties have not agreed on a Project Mediator, the parties shall forthwith provide the Coordinator with the written materials referred to in subparagraphs 3)(a), 3)(b) and 3)(c) of GC8.8.4 together with a request that the Coordinator assist in the appointment of a mutually acceptable Project Mediator in accordance with these Rules.
- 5) Within 5 working days following receipt of the request and materials referred to in paragraph 4) of GC8.8.4, the Coordinator shall provide the parties with a list of qualified private sector mediators obtained from an independent and impartial entity, together with instructions to each party to individually and confidentially select and rank their preferred and fully acceptable choices of mediator in descending order. Each mediator listed shall be impartial and independent of the parties, and shall be an experienced and skilled commercial mediator, preferably with knowledge of the subject matter of the dispute.
- 6) Within 10 working days of receipt of the list referred to in paragraph 5) of GC8.8.4 each party shall comply with the instructions accompanying the list(s) and shall deliver the completed listing to the Coordinator.

- 7) Within 2 working days following receipt of the completed listings, the Coordinator shall select the highest common ranked mediator to act as Project Mediator for the purposes of the contract.
- 8) In the event of a tie, the Coordinator shall consult both parties to re-evaluate their rankings in order to assist the Coordinator in selecting a Project Mediator acceptable to both parties. If the parties cannot agree upon a Project Mediator, the Coordinator shall forthwith provide the parties with a second list of mediators and the procedure shall be repeated.
- 9) If the parties have not previously entered into a contract with a mutually acceptable Project Mediator, the Coordinator shall use reasonable efforts to negotiate a contract with a mutually acceptable Project Mediator on behalf of the parties, which contract shall incorporate or otherwise comply with the provisions of these Rules. If negotiations are unsuccessful, or if for other reason the individual is unwilling or unable to enter into a contract to act as Project Mediator, the Coordinator shall repeat the process with the second-highest common ranked mediator.
- 10) The parties agree that, upon successful completion of the negotiations referred to in paragraph 9) of GC8.8.4, they shall jointly enter into a contract with the selected Project Mediator, which contract shall be in a form drafted by the Coordinator and agreed to by the parties.
- 11) Upon execution of the contract with the Project Mediator referred to in paragraph 10) of GC8.8.4 the Coordinator shall provide the Project Mediator with copies of the documents referred to in paragraph 3) of GC8.8.4.

GC8.8.5 Confidentiality

- 1) Subject to paragraph 2) of GC8.8.5, and unless otherwise agreed in writing by the parties, the Project Mediator, the parties and their counsel or representatives shall keep confidential all matters and documents disclosed during mediation proceedings except where the disclosure is necessary for any implementation of any agreement reached or is required by law.
- 2) Evidence that is independently admissible or discoverable in any arbitral or judicial proceeding shall not be rendered inadmissible or non-discoverable by virtue of its use in mediation proceedings.
- 3) Neither party shall make transcripts, minutes or other records of a mediation conference.
- 4) The personal notes and written opinions of the Project Mediator made in relation to mediation are in the Project Mediator's sole possession and control, are confidential, and may not be used in any subsequent proceeding between the parties or where they are opposed in interest without the express written permission of the parties.
- 5) All information exchanged during mediation procedures, by whatever means, shall be without prejudice and shall be treated as confidential by the parties and their representatives, unless otherwise required by law.

GC8.8.6 Time and Place of Mediation

- 1) The Project Mediator, in consultation with the parties shall set the date, time and place of any mediation conference as soon as possible, bearing in mind that, subject to agreement to

the contrary between the parties, only 10 working days are available within which to attempt to settle the dispute.

GC8.8.7 Representation

- 1) Representatives of the parties may be accompanied at the mediation conference by legal counsel or any other person.
- 2) If the Project Mediator is a lawyer, the Project Mediator shall not provide legal advice to a party during the course of the mediation conference, but may recommend that a party obtain independent legal advice before finalizing a settlement agreement.

GC8.8.8 Procedure

- 1) The parties agree to an exchange of all facts, information and documents upon which they intend to rely in any oral or written presentation during the mediation. This exchange shall be completed no later than 2 working days prior to the date set for a mediation conference.
- 2) The Project Mediator shall be free to meet with the parties individually during a mediation conference if the Project Mediator is of the opinion that this may improve the chances of a mediated settlement, and either party may request such an individual meeting at any time.
- 3) The parties may agree to extend the 10 working days available for settlement of the dispute through mediation, and the Project Mediator shall record that agreement in writing.

GC8.8.9 Settlement Agreement

- 1) The parties shall record in writing any settlement agreement reached, with sufficient detail to ensure a clear understanding of
 - (a) the issues resolved;
 - (b) any obligations assumed by each party including criteria to determine if and when these obligations have been met; and
 - (c) the consequences of failure to comply with the agreement reached.
- 2) The parties agree to carry out the terms of a settlement agreement as soon as possible and, in any event, within any time periods specified in the agreement.

GC8.8.10 Termination of Mediation

- 1) Either party may withdraw from mediation at any time without reason and, in that event, the Project Mediator shall give each party a written notice terminating the mediation and establishing the effective date of termination.
- 2) If, in the opinion of the Project Mediator, either party fails to mediate in good faith or fails to comply with the terms of these Rules, or if the Project Mediator, at any time during mediation, is of the opinion that further negotiations will fail to resolve the issues outstanding, the Project Mediator may terminate the negotiations by providing the parties with a written notice of termination, stating therein the Project Mediator's reasons for the termination, and the effective date of termination.

- 3) If a dispute has not been resolved within 10 working days or such other longer period as may have been agreed to by the parties, the Project Mediator shall terminate the mediation by giving written notice to the parties stating the effective date of termination.

GC8.8.11 Costs

- 1) The parties agree that they will each be responsible for the costs of their own representatives and advisors and associated travel and living expenses. Fees and expenses of the Project Mediator and all administrative costs of mediation, such as the cost of the meeting room(s), if any, shall be borne equally by the parties.

GC8.8.12 Subsequent Proceedings

- 1) The parties shall not rely on or introduce as evidence in any arbitral or judicial proceeding, whether or not such proceeding relates to the subject matter of mediation,
 - (a) any documents of other parties that are not otherwise producible in those proceedings;
 - (b) any views expressed or suggestions made by any party in respect of a possible settlement of issues;
 - (c) any admission made by any party in the course of mediation unless otherwise stipulated by the admitting party; and
 - (d) the fact that any party has indicated a willingness to make or accept a proposal or recommendation for settlement.
- 2) The Project Mediator shall neither represent nor testify on behalf of either of the parties in any subsequent investigation, action or proceeding relating to the issues in mediation proceedings.
- 3) The Project Mediator shall not be subpoenaed to give evidence relating to
 - (a) the Project Mediator's role in mediation; or
 - (b) the matters or issues in mediation;in any subsequent investigation, action or proceeding and the parties agree to vigorously oppose any effort to have the Mediator so subpoenaed.

GC9 CONTRACT SECURITY

GC9.1 OBLIGATION TO PROVIDE CONTRACT SECURITY

GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY

GC9.1 OBLIGATION TO PROVIDE CONTRACT SECURITY

- 1) The Contractor shall, at the Contractor's expense and within 14 days after the date that the Contractor receives notice that the Contractor's bid was accepted by Canada, obtain and deliver Contract Security to Canada in one of the forms prescribed in GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY.
- 2) If the whole or a part of the Contract Security provided is in the form of a security deposit, it shall be held and disposed of in accordance with GC5.13 RETURN OF SECURITY DEPOSIT and GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN.
- 3) If a part of the Contract Security provided is in the form of a labour and material payment bond, the Contractor shall post a copy of that bond at the site of the Work.
- 4) It is a condition precedent to the release of the first progress payment that the Contractor has provided the Contract Security as specified herein.

GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY

- 1) The Contractor shall deliver to Canada either (a) or (b).
 - (a) A performance bond and a labour and material payment bond each in an amount that is equal to not less than 50 percent of the Contract Amount.
 - (b) A security deposit or an irrevocable standby letter of credit in an amount that is equal to not less than 20 percent of the Contract Amount.
- 2) A performance bond and a labour and material payment bond referred to in paragraph 1) of GC9.2 shall be in a form and be issued by a bonding or surety company that is approved by Canada.
 - (a) The approved form for the performance bond is displayed at the following Website:
<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494§ion=text#appS>
 - (b) The approved form for the labour and material payment bond is displayed at the following website: <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494§ion=text#appS>
; and
 - (c) The list of approved bonding or surety companies is displayed at the following Website:
<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494§ion=text#appL>
- 3) A security deposit referred to in subparagraph 1)(b) of GC9.2 shall be in the form of
 - (a) a bill of exchange, bank draft or money order made payable to the Receiver General for Canada and certified by an approved financial institution or drawn by an approved financial institution on itself; or

- (b) bonds of, or unconditionally guaranteed as to principal and interest by, the Government of Canada.
- 4) For the purposes of subparagraph 3)(a) of GC9.2
- (a) a bill of exchange is an unconditional order in writing signed by the Contractor and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable future time a sum certain of money to, or to the order of, the Receiver General for Canada;
 - (b) if a bill of exchange, bank draft or money order is certified by or drawn on an institution or corporation other than a chartered bank, it must be accompanied by proof that the said institution or corporation meets at least one of the criteria described in subparagraph 4)(c) of GC9.2, either by letter or by a stamped certification on the bill of exchange, bank draft or money; and
 - (c) An approved financial institution is
 - (i) a corporation or institution that is a member of the Canadian Payments Association as defined in the [Canadian Payments Act](#);
 - (ii) a corporation that accepts deposits that are insured, to the maximum permitted by law, by the Canada Deposit Insurance Corporation or the "Autorité des marchés financiers";
 - (iii) a corporation that accepts deposits from the public if repayment of the deposit is guaranteed by Her Majesty the Queen in right of a province;
 - (iv) a corporation, association or federation incorporated or organized as a credit union or co-operative credit society that conforms to the requirements of a credit union which are more particularly described in paragraph 137(6) of the [Income Tax Act](#); or
 - (v) Canada Post Corporation.
- 5) Bonds referred to in subparagraph 3)(b) of GC9.2 shall be provided on the basis of their market value current at the date of the Contract, and shall be
- (a) made payable to bearer; or
 - (b) accompanied by a duly executed instrument of transfer of the bonds to the Receiver General for Canada in the form prescribed by the Domestic Bonds of Canada Regulations; or
 - (c) registered as to principal, or as to principal and interest, in the name of the Receiver General for Canada pursuant to the Domestic Bonds of Canada Regulations.
- 6) An irrevocable standby letter of credit referred to in subparagraph 1)(b) of GC9.2 shall:
- (a) be an arrangement, however named or described, whereby a financial institution (the "Issuer") acting at the request and on the instructions of a customer (the "Applicant") or on its own behalf,
 - (i) is to make a payment to, or to the order of, Canada as the beneficiary;
 - (ii) is to accept and pay bills of exchange drawn by Canada;

- (iii) authorizes another financial institution to effect such payment or accept and pay such bills of exchange; or
 - (iv) authorizes another financial institution to negotiate against written demand(s) for payment provided that the terms and conditions of the letter of credit are complied with;
- (b) state the face amount that may be drawn against it;
- (c) state its expiry date;
- (d) provide for sight payment to the Receiver General for Canada by way of the financial institution's draft against presentation of a written demand for payment signed by Canada;
- (e) provide that more than one written demand for payment may be presented subject to the sum of those demands not exceeding the face value of the letter of credit;
- (f) provide that it is subject to the International Chamber of Commerce (ICC) Uniform Customs and Practice (UCP) for Documentary Credits, 2007 Revision, ICC Publication No. 600. Pursuant to the ICC UCP, a credit is irrevocable even if there is no indication to that effect; and
- (g) be issued or confirmed, in either official language in a format left to the discretion of the issuer or confirmer, by an approved financial institution on its letterhead.

GC10 INSURANCE

GC10.1 INSURANCE CONTRACTS

GC10.2 INSURANCE PROCEEDS

GC10.1 INSURANCE CONTRACTS

- 1) The contractor shall, at the contractor's expense, obtain and maintain insurance contracts in respect of the work and shall provide evidence thereof to Canada in accordance with the requirements of the INSURANCE TERMS.
- 2) The insurance contracts referred to in paragraph 1) of GC10.1 shall
 - (a) be in a form, of the nature, in the amounts, for the periods and containing the terms and conditions specified in INSURANCE TERMS; and
 - (b) provide for the payment of claims under such insurance contracts in accordance with GC10.2 INSURANCE PROCEEDS.

GC10.2 INSURANCE PROCEEDS

- 1) In the case of a claim payable under a Builders Risk/Installation (All Risks) insurance contract maintained by the contractor pursuant to GC10.1 INSURANCE CONTRACTS, the proceeds of the claim shall be paid directly to Canada, and
 - (a) the monies so paid shall be held by Canada for the purposes of the contract, or
 - (b) if Canada elects, shall be retained by Canada, in which event they vest in Canada absolutely.
- 2) In the case of a claim payable under a General Liability insurance contract maintained by the contractor pursuant to GC10.1 INSURANCE CONTRACTS, the proceeds of the claim shall be paid by the insurer directly to the claimant.
- 3) If an election is made pursuant to paragraph 1) of GC10.2, Canada may cause an audit to be made of the accounts of the contractor and of Canada in respect of the part of the work that was lost, damaged or destroyed for the purpose of establishing the difference, if any, between
 - (a) the aggregate of the amount of the loss or damage suffered or sustained by Canada, including any costs incurred in respect of the clearing and cleaning of the work and its site and any other amount that is payable by the contractor to Canada under the contract, minus any monies retained pursuant to subparagraph 1)(b) of GC10.2; and
 - (b) the aggregate of the amounts payable by Canada to the contractor pursuant to the contract up to the date of the loss or damage.
- 4) A difference that is established pursuant to paragraph 3) of GC10.2 shall be paid forthwith by the party who is determined by the audit to be the debtor to the party who is determined by the audit to be the creditor.

- 5) When payment of a deficiency has been made pursuant to paragraph 4) of GC10.2, all rights and obligations of Canada and the contractor under the contract shall, with respect only to the part of the work that was the subject of the audit referred to in paragraph 3) of GC10.2, be deemed to have been expended and discharged.
- 6) If an election is not made pursuant to subparagraph 1)(b) of GC10.2, the contractor shall, subject to paragraph 7) of GC10.2, clear and clean the work and its site and restore and replace the part of the work that was lost, damaged or destroyed at the contractor's expense as if that part of the work had not yet been performed.
- 7) When the contractor clears and cleans the work and its site and restores and replaces the work referred to in paragraph 6) of GC10.2, Canada shall pay the contractor out of the monies referred to in paragraph 1) of GC10.2 so far as they will thereunto extend.
- 8) Subject to paragraph 7) of GC10.2, payment by Canada pursuant to paragraph 7) of GC10.2 shall be made in accordance with the contract but the amount of each payment shall be 100 percent of the amount claimed notwithstanding subparagraphs 3)(a) and 3)(b) of GC5.4 PROGRESS PAYMENT.



Appendix "E"

TECHNICAL SPECIFICATIONS & PLANS

PROJECT MANUAL
Including Specifications for
Agriculture & Agri-Food Canada
Entomology Lab Retrofit
Building #25
Brookfield Road, St. John's, NL

"Issued for Tender"

Agriculture & Agri-Food Canada
Entomology Lab Retrofit
Building #25
Brookfield Road, St. John's, NL

Section COVERPAGE
Page 1
11/06/2015

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440 University Avenue
Charlottetown, PE C1A 4N6

PRIME CONSULTANT: Architecture49 Inc.
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CONSULTANT: WSP Canada Inc.
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St. John's, NL A1B 1C4

A49 Project No.: 15-173
PWGSC Project No.: 1516-143310-P08
Date: November 6, 2015
"Issued for Tender"

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Appendix 'A'

- Asbestos Management Plan by AMEC Earth & Environmental, dated February 23, 2007

Appendix 'B'

- Asbestos Report AAFC, Building 25

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- A2-R0 Existing/Demolition/New Level 1 Partial Floor Plans
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1.1 DESCRIPTION
OF WORK

- .1 In general work of this contract consists of interior demolition and new construction of a laboratory of approximately 30 m² area located within the existing building 25 at the Atlantic Cool Crop Research Facility, Brookfield Road, St. John's, NL. Demolition generally includes interior finishes, ceilings, millwork, mechanical and electrical. Existing construction contains asbestos, manage and abate to applicable codes and standards and to section 02 82 00.02 refer also to Appendix 'A' - Asbestos Management Plan.
- .2 Re-construction generally encompasses new partitions, finishes, and ceilings, laboratory millwork, mechanical and electrical systems.
- .3 The overall facility is occupied, however the work areas will be vacant during the work. Certain restrictions apply to work hours provision of noise, vibration and dirt generating activities. Removal of demolished materials from the building may have to be carried out outside of business hours, at night and on weekends.

1.2 SITE
FAMILIARIZATION

- .1 Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and temporary facilities required to perform the work.
- .2 Contact and obtain permission from the Departmental Representative before carrying out such site visit.

1.3 WORK SCHEDULE

- .1 Submit within 7 calendar days after contract award, a construction schedule showing commencement and completion of all work within the time stated in the accepted bid.
- .2 Provide sufficient details in Schedule to clearly illustrate the entire implementation plan to achieve completion of the work on time and to monitor efficient use of resources and the progress of work in relation to established milestones.

- .3 Work Schedule shall include:
 - .1 Bar (Gantt) Chart indicating all work activities, their anticipated duration and planned dates for achieving major milestones and;
 - .2 Written narrative for key elements of work providing sufficient information to demonstrate a reasonable implementation plan.
- .4 Schedule work in cooperation with and to the approval of the Departmental Representative.
- .5 Submit updates when requested by Departmental Representative.

1.4 WORK
RESTRICTIONS

- .1 Mobilization to project site is to commence immediately after acceptance of bid and submission of Site Specific Safety Plan, unless otherwise agreed in writing by Departmental Representative.
- .2 Project work on site is to commence as soon as possible, with a continuous reasonable work force, unless otherwise agreed in writing by Departmental Representative.
- .3 Facility operations shall continue during the work. Schedule and sequence work in cooperation with operators. Provide temporary security barriers to maintain existing level of security. After hours and weekend work may be necessary. All costs to be included in the tender price.

1.5 CODES AND
STANDARDS

- .1 Perform work in accordance with the National Building Code of Canada (of latest edition as adopted by the province and municipality of the work location) and any other code of provincial or local application, including all amendments up to the bid closing date, provided that in any case of conflict or discrepancy the more stringent requirement shall apply.
- .2 Perform electrical work in accordance with CSA C22.1-2006. Use only licensed electricians to carry out such work.
- .3 Materials and workmanship must meet or exceed

requirements of specified standards, codes and referenced documents.

1.6 INTERPRETATION
OF DOCUMENTS

- .1 Supplementary to the General Conditions of the Contract, the Division 01 sections take precedence over the technical specification sections in other Divisions of the Specification Manual.

1.7 TERM ENGINEER

- .1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative and vice versa as defined in the General Conditions of the Contract.

1.8 DOCUMENTS
REQUIRED

- .1 Maintain at job site, one copy each of the following:
- .1 Contract Drawings, Specifications, addenda and reviewed shop drawings.
 - .2 Work Schedule
 - .3 Health and Safety Plan and other safety documents related to the Work.
 - .4 Shop Drawings.
 - .5 Change Orders
 - .6 Field test reports.
 - .7 Reports received from various inspection authorities.
 - .8 Permits and regulatory approvals and requirements.
 - .9 Other documents as stipulated in the contract documents.

1.9 PERMITS and
AUTHORITIES INSPECTIONS

- .1 Obtain and pay for building permit, authorities inspections, compliance certificates, licenses and other applicable permits as required by municipal, provincial and federal authorities to perform the Work.
- .2 Provide appropriate notifications of project to provincial and other authorities having jurisdiction.
- .3 Upon request, submit copy of applications made

and permits received to Departmental Representative.

- 1.10 PROJECT MEETINGS .1 Project meetings will be held during the course of the work at least b-weekly.
- .2 Arrange project meetings and assume responsibility for setting times and recording minutes. Distribute minutes within five (5) days of meeting.
- .3 Have Superintendent and subcontractors in attendance.
- 1.11 SETTING OUT WORK .1 Assume full responsibility for and execute complete layout of work.
- 1.12 ALTERATIONS TO EXISTING BUILDING .1 Execute work with least possible interference or disturbance to Facility operations, occupants.
- .2 Provide barricades, barriers and warning signs around work areas and adjacent to areas in use by Facility occupants and the Public.
- .1 Signage to be professionally made with bilingual message or use internationally recognized graphic symbols.
- .3 Do not block fire exits and emergency escape routes. Ensure free egress from buildings at all times during the work.
- .4 Follow Departmental Representative's directives in meeting above requirements.
- 1.13 WORK ACCESS .1 Use only designated roads, walkways, entrance doors and corridors designated by Departmental Representative to gain access to work areas.
- .2 Restrict movement of workers to immediate work areas. Plan work to minimize need for workers to circulate inside buildings of the Facility.
- 1.14 BUILDING SECURITY .1 Keys, door security access cards building security access codes security passes may be

issued to the Contractor, at the discretion of the Departmental Representative, to open locked doors and access secure areas at the site for work purposes.

- .2 Follow all instructions in regards to use, care and disposition of all keys and security cards issued.
- .3 Unless indicated otherwise, keys and security access devices given to Contractor's Superintendent shall be for his/her sole possession shall not under any circumstances be shared with any worker or subcontractor.
- .4 Do not, under any circumstances, make or allow workers to make duplicates of keys issued.
- .5 Immediately report to Departmental Representative any lost, stolen or destroyed keys and access cards.
- .6 At end of project, return all security devices to Departmental Representative.
- .7 Ensure building and other facilities of site are kept secure at all times. Lock all doors, activate building security system at end of each workday.
- .8 Cost incurred from police and security surveillance company resulting from falsely setting off security alarm system will be charged to the Contractor in the form of a financial assessment against the Contract.

1.15 TEMPORARY FACILITIES

- .1 Existing water and power supply may be used for construction at no cost. Departmental Representative will advise of the supply location.
 - .1 Be responsible for transporting such services to work areas.
- .2 Store materials on site only in location(s) within the work area and on site as directed by Departmental Representative.
- .3 Dust Barriers:

.1 In addition to temporary walls and doors, erect full height dust tight partitions to separate works areas from others areas of the building.

.2 Provide additional dust covers as required for major dust generating work to stop propagation of dust beyond work areas.

.3 Obtain Departmental Representative's approval beforehand on the proposed dust barrier assembly and location.

.4 Sanitary facilities are available on site.

1.16 HEATING AND VENTILATION

.1 Maintain existing heating, ventilation and air conditioning system operational within Occupied Areas during the entire course of work.

.2 Existing heating system may be used for construction purposes.

.3 Shut-down air distribution system in work areas from remainder of building. Seal ductwork, exhaust diffusers and grilles in work areas to stop spread of dust and fumes to Occupied areas of Facility.

.4 Provide suitable equipment and ventilate work areas as required to:

.1 Facilitate progress of work.

.2 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Prevent accumulations of dust, fumes, mists, vapours or gases within building.

.4 Prevent harmful accumulation of hazardous substances into atmosphere.

.5 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.5 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Maintain strict supervision of operation of temporary ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of existing services provided

by Departmental Representative.

1.17 CUTTING,
FITTING AND
PATCHING

- .1 Execute cutting fitting and patching required to make work fit properly.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .3 Do not cut, bore, or sleeve load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .5 Fit work airtight to pipes, sleeves, ducts, conduits and other services penetrating new or existing condition.
- .6 Openings made in existing fire rated walls, floors and ceilings shall be filled with purpose made, ULC approved, fire stopping materials and smoke seals.

1.18 EXISTING
SERVICES

- .1 Before commencing work, investigate and establish location and extent of concealed and buried service lines in area of work. Notify Departmental Representative of findings.
- .2 Where work involves breaking into, connecting or shutting down of existing services, obtain approval beforehand from Departmental Representative. Schedule and carryout work at time as directed by Departmental Representative with minimum of disturbance to Facility and site operations. Adhere to approved schedule and provide notice to affected parties.
- .3 Comply with electrical safety requirements specified in Section 01 35 25.
- .4 Protect, relocate or maintain existing active services as required. Where inactive services are encountered, cap off in manner approved by authority having jurisdiction over service. Record location of maintained, rerouted and abandoned service lines.

1.19 MATERIALS

- .1 Use new material and equipment unless otherwise specified.
- .2 Select and use products, adhesives and sealants which have:
 - .1 No or very low off-gassing levels.
 - .2 No or very little VOC content.
 - .3 Are the least noxious and emit smallest amount of fumes, gases and strong odors during their cure period.
 - .4 Minimal chemical, physical or biological elements or agents in their composition which adversely affect human health and welfare or which degrades the environment.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 Within 7 days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
 - .1 Name and Address of manufacturer.
 - .2 Trade Name, model and catalogue number.
 - .3 Performance, descriptive and test data indicating compliance with specified requirements.
 - .4 Manufacturer's installation or application instructions.
 - .5 Evidence of arrangements to procure.
 - .6 Evidence of manufacturer delivery problems or unforeseen delays.
- .6 Obtain manufacturer's printed installation instructions and comply by such directives for installation of materials.
- .7 Notify Departmental Representative in writing of any conflict between Specifications and manufacturer's instructions, so that Departmental Representative will designate which document is to be followed.

- .8 Deliver, store and protect materials on site against theft, vandalism, soiling and climatic damage. Provide additional suitable cover beyond manufacturer's packaging where required.
- .9 Touch-up factory finishes damaged by the Work. Use touch-up materials to match original. Do not paint over name plates.

1.20 FASTENERS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur unless indicated otherwise. Prevent electrolytic action between dissimilar metals.
- .2 Use non-corrosive heavy duty fasteners, anchors and spacers for all fastening conditions. Space fasteners within limits of load bearing or shear capacity. Ensure positive permanent anchorage.

1.21 HAZARDOUS MATERIALS

- .1 The work area and other areas of the building construction containing asbestos. Abate and manage to applicable codes and standards. Refer also to specification section 02 82 00.02 and Appendix 'A' - Asbestos Management Plan.
- .2 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling and storage, and disposal of hazardous materials.
- .3 Do not leave and store flammable and hazardous materials on site. Remove of site at end of each work shift.
- .4 Keep MSDS data sheets for all products brought on site. Provide copy to Departmental Representative.
- .5 Asbestos Discovery: Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos not already noted be encountered in course of work, immediately stop work and notify Departmental Representative. Do not proceed with relevant work until written instructions have been received from Departmental Representative.

1.22 ENVIRONMENTAL
PROTECTION

- .1 Have appropriate emergency spill response equipment and rapid clean-up kit on site. Provide personal protective equipment required for clean-up.
- .2 Report all spills of petroleum, hazardous materials and accidents having potential of polluting the environment to Federal and Provincial Department of the Environment and to the Departmental Representative.
- .3 Do not pump water containing suspended materials into sewer or drainage systems. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.
- .4 Do not dump hazardous materials and polluted water containing suspended hazardous products into sewers and drainage systems. Dispose in accordance with federal and provincial environmental regulations and recommended procedures.
- .5 Fires and burning of waste and rubbish on site is prohibited.

1.23 INSPECTION
AND TESTING

- .1 Give timely notice requesting inspection of work designated for inspections, special tests or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 In accordance with the General Conditions, Departmental Representative may order any part of work to be examined if work is suspected to be not in accordance with Contract Documents.
- .3 Rejected Work: removal and replace defective work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.
- .4 Tests on materials and equipment, is the responsibility of the Contractor except where

specified otherwise.

.1 Provide all necessary instruments, equipment and qualified personnel to perform tests.

.2 At completion of tests, turn over two sets of fully documented tests reports to the Departmental Representative.

.5 Unspecified tests may also be made by Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.

.6 Where tests or inspection reveal work not in accordance with the Contract, the Contractor shall bear the cost of additional tests and inspections incurred by Departmental Representative as required to verify the acceptability of corrected work.

.7 If Contractor covers or permits to be covered work designated for special tests, inspections or approvals before such is made, uncover work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed. Pay costs to uncover and make good such work.

1.24 CLEANING

.1 As work progresses, maintain work areas and site in a tidy, clean and dust free condition at all times.

.2 Provide on-site containers for placement of waste and debris. Loose and scattered waste, debris and materials will not be allowed on site.

.3 Remove and dispose of waste and debris off site at end of each workday.

.4 Clean interior of building used by workers and dirtied by work.

.1 Wash walls, floors and other surfaces as needed.

.2 Vacuum carpets.

.3 Dust all furnishings.

.5 At project completion, conduct final cleaning of areas affected by work.

- .1 Remove dust and dirt from all surfaces with recommended cleaning agents.
- .2 Wash and polish finish surfaces.
- .3 Wash clean pavements, rake clean grassed areas used.
- .6 Use competent persons experienced in commercial cleaning operations.
- .7 Meager attempt at controlling dust and ineffective cleaning will not be tolerated.
 - .1 Failure to provide effective dust control and/or perform proper cleaning by the Contractor will result in the Departmental Representative to proceed and obtain an independent commercial cleaning agency to perform all required cleaning to the satisfaction of the Facility tenant for which the costs will be charged to the Contractor in the form of a financial assessment against the Contract.

1.25 WASTE
MANAGEMENT

- .1 Dispose of waste, debris and product packaging in accordance with municipal and provincial laws and regulations.
- .2 Plan work to minimize waste, maximize reuse and recycling of materials and to divert the greatest amount of waste from being disposed into landfill sites.
- .3 Separate waste, debris, leftover material, redundant equipment and product packaging at source, place into pre-planned waste categories during the course of the work and send to recycling facilities to maximum extent possible.
- .4 Store, handle and dispose of hazardous waste in covered, locked steel dumpsters in accordance with applicable federal, provincial and municipal laws, regulations, codes and guidelines.
- .5 Upon request, submit written list of items salvaged and sent to recycling facility

1.26 COST
BREAKDOWN

- .1 Before submitting first progress claim, submit a breakdown of the contract price in format and detail as directed by Departmental

Representative.

1.27 ACCEPTANCE

- .1 Notify Departmental Representative in writing when work is complete and ready for final inspection.
 - .1 Make a check of all work and correct all discrepancies, defects and outstanding work before sending notification.
- .2 Accompany Departmental Representative during final inspection.
- .3 Rectify all defects, faults and outstanding items identified by Departmental Representative during inspection.

1.1 SUBMITTALS

- .1 Upon acceptance of bid and prior to commencement of work, submit to Departmental Representative the following work management documents:
 - .1 Work Schedule as specified herein.
 - .2 Shop Drawing Submittal Schedule specified in section 01 33 00
 - .3 Waste Management Plan specified in section 01 74 21
 - .4 Environmental Plan specified in section 01 35 43
 - .5 Health and Safety Plan specified in section 01 35 28.
 - .6 Hot Work Procedures specified in section 01 35 24
 - .7 Dust Control Plan specified in section 01 50 00.
 - .8 List of workers requiring security clearance and those to be placed on Site Security Control list as specified in section 01 35 54.

1.2 WORK SCHEDULE

- .1 Upon acceptance of bid submit:
 - .1 Work schedule within 7 calendar days of contract award.
- .2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.
- .3 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
- .4 Work schedule content to include as a minimum the following:
 - .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;
 - .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project within designated time.
 - .3 Generally Bar Charts derived from

commercially available computerized project management system are preferred but not mandatory.

- .6 Schedule work in cooperation with the Departmental Representative. Incorporate within Work Schedule, items identified by Departmental Representative during review of schedule.
- .7 Completed schedule shall be approved by Departmental Representative. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's approval.
- .8 Ensure that all subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.
- .9 Schedule Updates:
 - .1 Submit on a monthly basis.
 - .2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
 - .3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
- .10 Departmental Representative will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Departmental Representative. Address and take corrective measures on items identified by reviews and as directed by Departmental Representative. Update schedule accordingly.
- .11 In every instance, change or deviation from the Work Schedule, no matter how minimal the risk or impact on safety or inconvenience to tenant or public might appear, will be subject to prior review and approval by the Departmental Representative.

1.3 OPERATIONAL RESTRICTIONS

- .1 The Contractor must recognize that building occupants will be affected by implementation of this contract. The Contractor must perform the work with utmost regard to the safety, security and convenience of building occupants and users.

- All work activities must be planned and scheduled with this in mind. The Contractor will not be permitted to disturb any portion of the building without providing temporary facilities as necessary to ensure safe and direct passage through disturbed or otherwise affected areas.
- .2 Contractor to meet with the Departmental Representative on a weekly basis to identify intended work areas, activities and scheduling for the coming week.
 - .3 To assure that construction work may proceed productively without risk to safety of building occupants and the public, and due to the nature of the tenant's operation be aware that certain work of this contract must be carried out during "Off-Hours".
 - .4 Off Hours: means a period of time which is outside the daily operational hours of the tenants of the Facility. For the purposes of this contract, Off-Hours are defined as follows:
 - .1 Weeknight Off-Hours: between the hours of 18:00 and 07:00 for each weekday Monday to Thursday inclusive.
 - .2 Weekend Off-Hours: between the hours of 18:00 Friday evening to 07:00 Monday morning.
 - .3 Dependent on the nature and location of the construction activity and due to an unanticipated operational requirement of the Tenant, certain off-hour periods may be redefined by adjusting the start and end time periods or cancellation of a specific off-hour workshift during the course of the Work.
 - .5 The following work shall be performed during Off-Hours:
 - .1 Erection and dismantling of dust barriers, hoarding or other protective devices to separate areas of Facility occupied and under use by public and tenants from work areas;
 - .2 Asbestos abatement;
 - .3 Demolition of any masonry or concrete inside building;
 - .4 All work involving saw cutting or boring of openings through masonry and concrete walls, floors, ceilings or roof;
 - .5 Work which requires the use of products controlled by WHMIS and for which MSDS sheets indicate toxic or hazardous materials requiring

special handling and application procedures;
.6 Use of materials having high solvent content or other content emitting strong noxious fumes or odours;
.7 Removal of demolition debris from the building including cleaning of premises;
.8 Cleaning and preparing of occupied areas for daytime use by tenants immediately following an off-hour workshift;
.9 Work within a tenant occupied area including corridors, stairwells and other circulation routes under use;
.10 Work which requires the temporary disconnection of power and communication services to occupied areas;
.11 Testing of fire alarms and other emergency annunciating system;
.12 Delivery of materials and equipment from exterior to the interior of building when access routes are located in tenant occupied spaces.
.13 Work which creates excessive noise or vibration creating interference with tenant operations.

- .6 Departmental Representative reserves the right to stop certain daytime work activities, if the nature of that activity generates excessive noise or dust and have Contractor re-schedule that particular work to be performed during the Off-Hour period.
- .7 Ensure that all trades are aware of the "Off-Hour" requirements of this contract and ensure that any extra costs incurred as a result is included in the Contractor's bid price for the work. No extra cost will be paid due to failure by General Contractor or his sub-contractors to recognize the off-hour requirements and other restrictions specified herein and to include all necessary allowances within their bids.
- .8 See section 01 35 54 in regards to:
.1 Special security requirements which must be observed in the course of work.
.2 Provision of security personnel by Contractor as part of the Work.
- .9 Facility circulation maintained:
.1 Ensure that entrances, corridors, stairwells, fire exits and other circulation routes are maintained free and clear providing

safe and uninterrupted passage for Facility users and public at all times during the entire work.

.2 Maintain those areas clean and free of construction materials and equipment. Provide temporary dust barriers and other suitable enclosures to ensure users are not exposed to construction activities and are protected from exposure to dust, noise and hazardous conditions.

.3 Maintain fire escape routes accessible and firefighting access open all times for the duration of the project.

.4 Do not under any circumstances block fire exit doors. Do not leave construction materials or debris in corridors, stairwells building entrances and exits.

.11 Safety Signage:

.1 Provide onsite, and erect as required during progress of work, mounted on self-supporting stands, warning the building occupants of construction activities in progress and alerting need to exercise caution in proceeding through disturbed areas of the facility, and directing building occupants through any detours which may be required.

.2 Signage to be professionally printed and mounted on wooden backing, coloured and to express messages as directed by the Departmental Representative.

.3 Generally maximum size of sign should be in the order of 1.0 square meters. Number of signs required will be dependent on number of areas in facility under renovation at any one time.

.4 Include costs for the supply and installation of these signs in the bid price.

.12 Dust and Dirt Control:

.1 See section 01 50 00 and 01 74 11 for dust control and cleaning requirements.

.2 Effectively plan and implement dust control measures and cleaning activities as an integral part of all construction activities. Review all measures with the Departmental Representative before undertaking work, especially for major dust generating activities.

.3 Do not allow demolition debris and construction waste to accumulate on site and contribute to the propagation of dust.

.4 As work progresses, maintain construction areas in a tidy condition at all times. Remove gross dust accumulations by cleaning and

vacuuming immediately following the completion of any major dust generating activity.

.5 Immediately remove all debris and dust from within occupied areas as generated by work therein during a given workshift.

.6 Disconnect and seal-off ductwork of HVAC servicing the construction area to stop spread of dust into other areas of Facility.

.7 Avoid situations and practices which results in dust and dirt being brought from the construction areas or from the exterior and tracked inside the building into occupied areas used by tenants and the public.

.8 Inform workers and make them sensitive to the need for dust and dirt control. Stringently enforce rules and regulations, immediately address non-compliance.

.9 Keep access doors to work areas closed at all times. Use only designated doors for entry or egress.

.13 Work in Occupied Areas:

.1 Where work must be carried out in an occupied area beyond the boundaries of the enclosed construction site, perform such work during the non-operational off-hour periods of the Facility.

.2 Ensure that all dust, dirt, debris, construction waste, materials, tools and equipment are completely removed at the end of each "off-hour" workshift. Clean and reinstate area ready for daytime use by tenant.

.3 Provide temporary dust barriers around immediate work areas and place fabric drop sheets over workstations, equipment and other furnishings located immediately adjacent to such work.

.4 Conduct work in such a way as to minimize the creation of dust and to avoid contaminating areas beyond the immediate location.

.5 Discuss and obtain Departmental Representative's approval beforehand on the type and extent of dust barriers, protective devices and measures needed.

.6 Be responsible for temporarily moving office furnishings, workstations, computer equipment and other objects as needed to gain access and conduct work. Reinstall all dislocated items at end of each workshift making the area operational again.

.7 Disconnect and reconnect any power and communications systems feeding workstations as

required.

.8 Clean such areas as well as those corridors and routes used to gain entry and access.

.14 Cleaning of tenant occupied areas used by Contractor:

.1 Clean lobbies, corridors, stairs and other circulation routes used by workers to gain access to work by conducting cleaning, vacuuming and washing of floors, walls and other soiled surfaces.

.2 Obtain and pay for the services of a professional cleaning company to perform this cleaning. Cleaning staff shall remain on site one hour beyond the end of each off-hour workshifts to address any Tenant complaints or concerns and carryout additional cleaning functions as directed by Departmental Representative or by a pre-designated person(s) representing the tenant(s).

.3 Meager attempts at controlling dust and ineffective unprofessional cleaning procedures will not be tolerated.

.4 Failure to provide effective dust control, allowing construction dust and dirt to escape beyond construction areas and contaminate occupied areas and building circulation areas will result in Contractor being ordered to immediately provide professional cleaning services without delay to remedy the situation and conduct all cleaning to the extent as determined by Departmental Representative. Alternatively, Departmental Representative may, at certain times and at own discretion; obtain the services of an independent building cleaning agency when cleaning being provided by Contractor is ineffective or tardy in response. Costs of such services will be charged against Contractor in the form of financial penalties or holdback assessments against the Contract.

.15 Ensure that all sub-trades are made aware of and abide by the contents of this section and in particular the work restrictions specified herein due to tenant operational requirements.

1.4 PROJECT MEETINGS

.1 Schedule and administer project meetings, held on a bi-weekly basis, for entire duration of work and more often when directed by Departmental Representative as deemed necessary due to

progress of work or particular situation.

- .2 Prepare agenda for meetings.
- .3 Notify participants in writing 4 days in advance of meeting date.
 - .1 Ensure attendance of all subcontractors.
 - .2 Departmental Representative will provide list of other attendees to be notified.
- .4 Hold meetings at project site or where approved by Departmental Representative.
- .5 Preside at meetings and record minutes.
 - .1 Indicate significant proceedings and decisions. Identify action items by parties.
 - .2 Distribute to participants by mail or by facsimile within 5 calendar days after each meeting.
 - .3 Make revisions as directed by Departmental Representative.
 - .4 Departmental Representative will advise whether submission of minutes by Email is acceptable. Decision will be based on compatibility of software among participants.

1.5 WORK
COORDINATION

- .1 The General Contractor is responsible for coordinating the work of the various trades and predetermining where the work of such trades interfaces with each other.
 - .1 Designate one person from own employ having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.
 - .2 Coordinate relocation and reinstallation of owner's existing security equipment with owner so as to permit airport operations and security procedures to continue.
- .2 The General Contractor shall convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required.
 - .1 Provide each trade with the plans and specs of the interfacing trade, as required, to assist them in planning and carrying out their respective work.
 - .2 Develop coordination drawings when deemed required illustrating potential interference between work of various trades and distribute to

all affected parties including structural trade.

- .1 Pay particular close attention to overhead work above ceilings and within or near to building structural elements.
 - .2 Coordination drawings to identify all building elements, services lines, rough-in points and indicate from where various services are coming.
 - .3 Review coordination drawings at purposely called meetings. Have subcontractors sign-off on drawings and publish minutes of each meeting.
 - .4 Plan and coordinate work in such a way to minimize quantity of service line offsets.
 - .5 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.
- .3 Submission of shop drawings and ordering of prefabricated equipment or prebuilt components shall only occur once coordination meeting for such items has taken place between trades and all conditions affecting the work of the interfacing trades has been made known and accounted for.
- .4 Work Cooperation:
- .1 Ensure cooperation between trades in order to facilitate the general progress of the work and avoid situations of spatial interference.
 - .2 Ensure that each trade provides all other trades reasonable opportunity for the completion of the work and in such a way as to prevent unnecessary delays, cutting, patching and the need to remove and replace completed work.
- .5 No extra costs to the Contract will be considered by the Departmental Representative as a result of Contractor's failure to effectively coordinate all portions of the Work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor to be resolved at own cost.

1.6 OTHER CONTRACTS

- .1 Further contracts may be let during the period that this contract is in progress.
- .2 Cooperate with other Contractors in carrying out their respective works and carry out all instructions from the Departmental Representative in this regard.

- .3 Connect properly and coordinate work with that of other Contractors. If any part of the work under this Contract depends for its proper execution or result upon the work of another Contractor, report promptly to the Departmental Representative, in writing, any defects in the work of such other Contractors as may interfere with the proper execution of this work.

1.1 SUBMITTAL

GENERAL REQUIREMENTS

- .1 Submit shop drawings, product data, samples and other items specified for review by Departmental Representative. PDF submission format is also acceptable.
- .2 Submit sufficient copies for own use plus 3 copies which will be kept by Departmental Representative.
 - .1 Include additional copies for insertion into the O & M manuals specified in section 01 78 00.
- .3 Accompany data with transmittal letter identifying project name, project number, Contractor's name and address, supplier name, description of items and quantity of drawings/data being submitted.
- .4 Allow 14 calendar days for review of shop drawings by Departmental Representative. Note that colours can only be selected after all shop drawings and samples of products requiring colour selections are received by the Departmental Representative.
- .5 Do not proceed with work applicable to shop drawing item until relevant submission has been reviewed by Departmental Representative.
- .6 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.
- .7 Present data, dimensions and engineering values in SI Metric units.
- .8 Review submittals prior to submission. Ensure that all requirements have been addressed, field dimensions and data have been taken and submittal has been checked and coordinated with work of contract documents.
- .9 Stamp and sign each item of submittal certifying contractor's review and verification of submitted data.

- .10 Submittals not stamped and signed will be returned unexamined by Departmental Representative and considered rejected.

1.2 SHOP DRAWINGS

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures and other data which are to be provided by Contractor to illustrate details of a portion of work.
- .2 Shop Drawings Content:
 - .1 Indicate materials, methods of construction, attachment, connections, explanatory notes and other information necessary for completion of work. Where items attach or connect to other items, confirm that all interrelated work has been coordinated, regardless of section or trade from which the adjacent work is being supplied and installed.
 - .2 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.
- .3 Shop Drawings Format:
 - .1 Opaque white prints or photocopies of original drawings or standard drawings modified to clearly illustrate work specific to project requirements. Maximum sheet size to be 1000 x 707 mm.
 - .2 Product data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products, to be original full colour brochures, clearly marked indicating applicable data and deleting information not applicable to project.
 - .3 Non or poorly legible drawings, photocopies or facsimiles will not be accepted and returned not reviewed.
 - .4 PDF submission format is also acceptable.
- .4 Delete information not applicable to project on all submittals.
- .5 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change contract price. If adjustments affect value of work, advise Departmental Representative

in writing prior to proceeding with work.

- .6 After Departmental Representative's review, distribute copies.
- .7 The review of shop drawings by Departmental Representative or by a Consultant or designated person so authorized by the Departmental Representative, is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Canada approves the detail design inherent in the 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 the 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.

1.3 SAMPLES

- .1 Submit samples for items specified in trade sections. Label with origin and intended use.
- .2 Deliver samples to Departmental Representative's office. Do not drop off samples at construction site except for special circumstances pre-approved by Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

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- 1.1 SECTION INCLUDES .1 Fire Safety Requirements
.2 Hot Work Permit
.3 Existing Fire Protection and Alarm Systems
- 1.2 RELATED WORK .1 Section 01 35 28 Health and Safety Requirements
- 1.3 REFERENCES .1 Fire Protection Standards issued by Fire Protection Services, Labour Program Division of Service Canada:
.1 FCC No. 301-June 1982 Standard for Construction Operations.
.2 FCC No. 302-June 1982 Standard for Welding and Cutting.
.2 FCC standards may be viewed at:
.1 <http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/commissioner.shtml>
.2 Fire Protection Services - Atlantic Region office, Halifax, N.S, Tel. (902) 426-6053.
- 1.4 DEFINITIONS .1 Hot Work defined as:
.1 Welding work
.2 Cutting of materials by use of torch or other open flame devices
.3 Grinding with equipment which produces sparks.
.4 Use of open flame torches.
- 1.5 SUBMITTALS .1 Submit copy of Hot Work Procedures and sample of Hot Work permit to Departmental Representative for review, within 14 calendar days of acceptance of bid.
.2 Submit in accordance with section 01 33 00.
- 1.6 FIRE SAFETY REQUIREMENTS .1 Implement and follow fire safety measures during Work. Comply with following:
.1 National Fire Code.
.2 Fire Protection Standards FCC 301 and FCC 302.
.3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
.2 In event of conflict between any provisions of above authorities the most stringent provision

will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.7 HOT WORK
AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization submit to Departmental Representative:
 - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
 - .2 Description of the type and frequency of Hot Work required.
 - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented and followed during performance of hot work, Departmental Representative will give authorization to proceed as follows:
 - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
 - .2 Subdivide the work into pre-determined, individual activities, each activity requiring a separately written authorization to proceed.
- .4 Requirement for individual authorization will be based on:
 - .1 Nature or phasing of work;
 - .2 Risk to Facility operations;
 - .3 Quantity of various trades needing to perform hot work on project or;
 - .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
- .6 In tenant occupied Facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed, perform Hot Work only during non-operative hours of the Facility. Follow

Departmental Representative's directives in this regard.

1.8 HOT WORK
PROCEDURES

- .1 Develop and implement safety procedures and work practices to be followed during the performance of Hot Work.
- .2 Hot Work Procedures to include:
 - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in section 01 35 28.
 - .2 Use of a Hot Work Permit system with individually written permit issued by Contractor's Superintendent to specific worker or subcontractor granting permission to proceed with Hot Work.
 - .3 Permit required for each Hot Work event.
 - .4 Designation of a person on site as a Fire Safety Watcher responsible to conduct a fire safety watch for a minimum duration of 60 minutes immediately following the completion of the Hot Work.
 - .5 Compliance with fire safety codes, standards and occupational health and safety regulations specified.
 - .6 Site specific rules and procedures in force at the site as provided by the Facility Manager.
- .3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Label document as being the Hot Work Procedures for this contract.
- .4 Procedures shall clearly establish responsibilities of:
 - .1 Worker performing hot work,
 - .2 Person issuing the Hot Work Permit,
 - .3 Fire Safety Watcher,
 - .4 Subcontractor(s) and Contractor.
- .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.
- .6 Failure to comply with fire safety procedures may result in the issue of a Non-Compliance notification as specified in Section 01 35 28.

- 1.9 HOT WORK PERMIT .1 Hot Work Permit to include the following:
- .1 Project name and project number;
 - .2 Building name and specific room or area where hot work will be performed;
 - .3 Date of issue;
 - .4 Description of hot work type needed;
 - .5 Special precautions to be followed, including type of fire extinguisher needed;
 - .6 Name and signature of permit issuer.
 - .7 Name of worker to which the permit is issued.
 - .8 Permit validity period not to exceed 8 hours. Indicate start time/date and termination time/date.
 - .9 Worker's signature with time/date of hot work completion.
 - .10 Stipulated time period of safety watch.
 - .11 Fire Safety Watcher's signature with time/date.

- .2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.
- .3 Each Hot Work Permit to be completed in full, signed and returned to Contractor's Superintendent for safe keeping on site.

- 1.10 FIRE PROTECTION AND ALARM SYSTEMS .1 Fire protection and alarm systems shall not be:
- .1 Obstructed.
 - .2 Shut-off, unless approved by Departmental Representative.
 - .3 Left inactive at the end of a working day or shift.
- .2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
- .3 Costs incurred, from the fire department, Facility owner and tenants, resulting from negligently setting off false alarms will be charged to the Contractor in the form of financial progress payment reductions and holdback assessments against the Contract.

- 1.11 DOCUMENTS ON SITE .1 Keep Hot Work Permits and Hazard assessment documentation on site for duration of Work.
- .2 Upon request, make available to Departmental Representative or to authorized safety

Agriculture & Agri-Food Canada
Entomology Lab Retrofit
Building #25
Brookfield Road, St. John's, NL

SPECIAL PROCEDURES ON
FIRE SAFETY REQUIREMENTS

Section 01 35 24
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Representative for inspection.

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- 1.1 SECTION INCLUDES .1 Procedures to isolate and lockout electrical facility and other equipment from energy sources.
- 1.2 RELATED WORK .1 Section 01 35 28: Health and Safety
- 1.3 REFERENCES .1 CSA C22.1-06 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
- .2 CAN/CSA C22.3 No.1-06 - Overhead Systems.
- .3 CSA C22.3 No.7-06 - Underground Systems.
- .4 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- 1.4 DEFINITIONS .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment has been isolated.
- .3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.
- .5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.

- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

1.5 COMPLIANCE
REQUIREMENTS

- .1 Comply with the following in regards to isolation and lockout of electrical facilities and equipment:
 - .1 Canadian Electrical Code
 - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations.
 - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
 - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.6 SUBMITTALS

- .1 Submit copy of proposed lockout procedures and sample of lockout permit or lockout tags to Departmental Representative for review, within 14 calendar days of acceptance of bid.
- .2 Submit in accordance with section 01 33 00.

1.7 ISOLATION OF
EXISTING SERVICES

- .1 Obtain Departmental Representative's written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.
- .2 To obtain authorization, submit to Departmental Representative the following documentation:
 - .1 Written request to isolate the particular service or facility and;
 - .2 Copy of Contractor's Lockout Procedures.
- .3 Make a Request for Isolation for each event, unless directed otherwise by Departmental

Representative, as follows:

- .1 Fill-out standard form in current use at the Facility as provided by Departmental Representative or;
 - .2 Where no form exist, make written request indicating:
 - .1 The equipment, system or service to be isolated and its location;
 - .2 Duration of isolation period (ie: start time & date and completion time & date).
 - .3 Voltage of service feed to system or equipment being isolated.
 - .4 Name of person making the request.
 - .4 Do not proceed with isolation until receipt of written notification from Departmental Representative granting the Isolation Request and authorization to proceed with the work.
 - .1 Note that Departmental Representative may designate another person at the Facility being authorized to grant the Isolation Request.
 - .5 Conduct safe, orderly shutdown of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.
 - .6 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require isolation of existing services.
 - .7 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of Facility operations. Follow Departmental Representative's directives in this regard.
 - .8 Conduct hazard assessment as part of the process in accordance with health and safety requirements specified Section 01 35 28.
- 1.8 LOCKOUTS
- .1 De-energize, isolate and lockout electrical facility, mechanical equipment and machinery from all potential sources of energy prior to working on such items.

- .2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.
- .3 Prepare typed written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site by workforce to safely isolate an active piece of equipment or electrical facility and effectively lockout and tag out it's sources of energy.
- .4 Include as part of the Lockout Procedures a system of lockout permits managed by Contractor's Superintendent or other qualified person designated by him/her as being "in-charge" at the site.
 - .1 A lockout permit shall be issued to specific worker providing a Guarantee of Isolation before each event when work must be performed on a live equipment or electrical facility.
 - .2 Duties of person managing the permit system to include:
 - .1 Issuance of permits and lockout tags to workers.
 - .2 Determining permit duration.
 - .3 Maintaining record of permits and tags issued.
 - .4 Making a Request for Isolation to Departmental Representative when required as specified above.
 - .5 Designating a Safety Watcher, when one is required based on type of work.
 - .6 Ensuring equipment or facility has been properly isolated.
 - .7 Collecting and safekeeping lockout tags returned by workers as a record of the event.
- .5 Clearly establish, describe and allocate responsibilities of:
 - .1 Workers.
 - .2 Person managing the lockout permit system.
 - .3 Safety Watcher.
 - .4 Subcontractor(s) and General Contractor.
- .6 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect specific project requirements.
 - .1 Incorporate site specific rules and procedures in force at site as provided by Facility Manager through the Departmental

Representative.

.2 Clearly label the document as being the Lockout procedures applicable to work of this contract.

.7 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.

.8 Use industry standard lockout tags.

.9 Provide appropriate safety grounding and guards as required.

1.9 CONFORMANCE

.1 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.

.2 Failure to follow lockouts procedures specified herein may result in the issuance of a Non-Compliance notification as specified in section 01 35 28.

1.10 DOCUMENTS
ON SITE

.1 Post Lockout Procedures on site in common location for viewing by workers.

.2 Keep copies of Request for Isolation forms and lockout permits and tags issued to workers on site for full duration of Work.

.3 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.

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- 1.1 RELATED WORK
- .1 Section 01 35 24: Special Procedures on Fire Safety Requirements.
 - .2 Section 01 35 25: Special Procedures on Lockout Requirements.
- 1.2 SUBMITTALS
- .1 Submit to Departmental Representative copies of the following documents, including updates:
 - .1 Site Specific Health and Safety Plan.
 - .2 Building Permit, compliance certificates and other permits obtained.
 - .3 Reports or directions issued by Federal, Provincial or other authority having jurisdiction.
 - .4 Accident or Incident Reports.
 - .5 MSDS data sheets.
 - .6 Name of Contractor's Representative designated to perform full time health and safety supervision on site.
 - .2 Upon request by Departmental Representative, submit reports and other documentation as stipulated to be produced and maintained by Federal and Provincial Occupational Health and Safety Regulations and as specified herein.
 - .3 Submit above documents in accordance with the submittal procedures specified in Section 01 33 00.
- 1.3 COMPLIANCE REQUIREMENTS
- .1 Comply with the Occupational Health and Safety Act for the Province of Newfoundland and Labrador, and the Occupational Health & Safety Regulations made pursuant to the Act.
 - .2 Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.
 - .3 Observe and enforce construction safety measures required by:
 - .1 National Building Code of Canada;
 - .2 Provincial Worker's Compensation Board;
 - .3 Municipal statutes and ordinances.

- .4 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.
- .5 A copy of the Canada Labour Code Part II may be obtained by contacting:

Canadian Government Publishing
Public Works & Government Services Canada
Ottawa, Ontario, K1A 0S9
Tel: (819) 956-4800 (1-800-635-7943)
Publication No. L31-85/2000 E or F)

- .9 Maintain Workers Compensation Coverage for duration of Contract. Submit Letter of Good Standing to Departmental Representative upon request.

1.4 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, of property and for protection of persons and public circulating adjacent to work operations to extent that they may be affected by conduct of the Work.
- .2 Enforce compliance by all workers, sub-contractors and other persons granted access to work site with safety requirements of Contract Documents, applicable Federal, Provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.5 SITE CONTROL AND ACCESS

- .1 Control work site and entry points to construction areas.
 - .1 Delineate and isolate construction areas from other areas of Facility by use of appropriate means.
 - .2 Post notices and signage at entry points and at other strategic locations identifying entrance onto site to be restricted to authorized persons only.
 - .3 Signage must be professionally made, bilingual in both official languages or display internationally understood graphic symbols.
- .2 Approve and grant access to site only to workers

and authorized persons.

.1 Immediately stop non-authorized persons from circulating in construction areas and remove from site.

.2 Provide site safety orientation to all persons before granting access. Advise of site conditions, hazards and mandatory safety rules to be observed on site.

.3 Secure site at night time to extent required to protect against unauthorized entry.

.4 Ensure persons granted access to site wear appropriate personal protective equipment (PPE) suitable to work and site conditions.

.1 Provide such PPE to authorized persons who require access to perform inspections or other approved purposes.

1.6 PROTECTION

.1 Carry out work placing emphasis on health and safety of the Public, Facility personnel, construction workers and protection of the environment.

.2 Erect safety barricades, lights and signage on site to effectively delineate work areas, protect pedestrian traffic around and adjacent to work and to create a safe working environment.

.1 Erect, hoarding and temporary lighting as required. See Section 01 50 00 for minimum acceptable barricades.

.3 Should unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.7 PERMITS

.1 Post on site permits, licenses, compliance certificates specified in section 01 10 10.

.2 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain his/her approval to proceed before carrying out that portion of work.

1.8 HAZARD
ASSESSMENTS

- .1 Conduct site specific health and safety hazard assessment before commencing project and during course of the work. Identify risks and hazards resulting from site conditions, weather conditions and work operations.
 - .1 Perform on-going assessments addressing new risks and hazards as work progresses including when new subtrade or subcontractor arrives on site.
 - .2 Also, conduct assessment when the scope of work has been changed by Change Order and when potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety Representative.
- .2 Record results in writing and address in Health and Safety Plan.
- .3 Keep copy of all assessments on site.

1.9 PROJECT/SITE
CONDITIONS

- .1 The following are known or potential project related health, environmental and safety hazards at site which must be properly managed if encountered during course of work:
 - .1 Environmental hazards lead, mould, MSDS, spills, ventilation required, heat stress, cold.
 - .2 Access to site scaffolding, slips, hoarding, safe access to other tenants.
 - .3 Communication plan.
 - .4 Lock out procedures, hot work, fire watch, traffic control, HVAC contamination from construction activity, emergency response, maintaining sprinkler system.
 - .5 Personal limitation of workers.
 - .6 PPE, working at heights.
 - .7 Activity hazards, electrical cord and equipment, airborne particles, energized equipment, burn/heat source/torching.
 - .8 Working at heights, barricades, holes, protection from falling items.
- .2 Above list shall not be construed as being complete and inclusive of potential health, and safety hazards encountered during work. Include above items into hazard assessment process.
- .3 Obtain from Departmental Representative, copy of MSDS Data sheets for existing hazardous products stored on site or used by Facility personnel.

1.10 HEALTH AND
SAFETY MEETINGS

- .1 Attend pre-construction health and safety meeting conducted by Departmental Representative. Have following persons in attendance:
 - .1 Site Superintendent.
 - .2 Contractor's designated Health and Safety Site Supervisor.
 - .3 Departmental Representative will advise of date, time and location.

- .2 Conduct health and safety meetings and tool box briefings on site. Hold on a regular and pre-scheduled basis during entire work in accordance with requirements and frequency as stipulated in provincial occupational health and safety regulations.
 - .1 Keep workers informed of potential hazards and provide safe work practices and procedures to be followed.
 - .2 Take written minutes and post on site.

1.11 HEALTH AND
SAFETY PLAN

- .1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work.
 - .1 Submit copy to Departmental Representative within 21 calendar days of acceptance of bid.
 - .2 Submit updates as work progresses.

- .2 Health and Safety Plan shall contain three (3) parts with following information:
 - .1 Part 1 - Hazards: List of individual health risks and safety hazards identified by hazard assessment process.
 - .2 Part 2 - Safety Measures: engineering controls, personal protective equipment and safe work practices used to mitigate hazards and risks listed in Part 1 of Plan.
 - .3 Part 3a: Emergency Response: standard operating procedures, evacuation measures and emergency response in the occurrence of an accident, incident or emergency.
 - .1 Include response to all hazards listed in Part 1 of Plan.
 - .2 Evacuation measures to complement the Facility's existing Emergency Response and Evacuation Plan. Obtain pertinent information from Departmental Representative.
 - .3 List names and telephone numbers of officials to contact including:
 - .1 General Contractor and all

Subcontractors.

.2 Federal and Provincial Departments as stipulated by laws and regulations and local emergency resource organizations, as needed based on nature of emergency or accident.

.3 Officials from PWGSC and site Facility management. Departmental Representative will provide list.

.4 Part 3b - Site Communications:

.1 Procedures used on site to share work related safety issues between workers, subcontractors, and General Contractor.

.2 List of critical tasks and work activities, to be communicated with the Facility Manager, which has risk of affecting tenant operations, or endangering health and safety of Facility personnel and the general public. Develop list in consultation with the Departmental Representative.

.3 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

Column 1	Column 2	Column 3
Part 1 Identified Hazards	Part 2 Safety Measures	Part 3a/3b Emergency Response & Site Communications

.4 Develop Plan in collaboration with subcontractors. Address work activities of all trades. Revise and update Plan as Sub-contractors arrive on site.

.5 Implement and enforce compliance with requirements of Plan for full duration of work to final completion and demobilization from site.

.6 As work progresses, review and update Plan. Address additional health risks and safety hazards identified by on-going hazard assessments.

.7 Post copy of Plan, and updates, on site.

.8 Submission of the Health and Safety Plan, and

updates, to the Departmental Representative is for review and information purposes only. Departmental Representative's receipt, review and any comments made of the Plan shall not be construed to imply approval in part or in whole of such Plan by Departmental Representative and shall not be interpreted as a warranty of being complete and accurate or as a confirmation that all health and safety requirements of the Work have been addressed and that it is legislative compliant. Furthermore, Departmental Representative's review of the Plan shall not relieve the Contractor of any of his legal obligations for Occupational Health and Safety provisions specified as part of the Work and those required by provincial legislation.

1.12 SAFETY
SUPERVISION AND
INSPECTIONS

- .1 Designate one person to be present on site at all times, responsible for supervising health and safety of the Work.
 - .1 Person to be competent in Occupational Health and Construction Safety as defined in the Provincial Occupational Health and Safety Act.
- .2 Assign responsibility, obligation and authority to such designated person to stop work as deemed necessary for reasons of health and safety.
- .3 Conduct regularly scheduled informal safety inspections of work site on a minimum bi-weekly basis.
 - .1 Note deficiencies and remedial action taken in a log book or diary.
- .4 Conduct Formal Inspections on a minimum monthly basis.
 - .1 Use standardized safety checklist forms.
 - .2 Prepare written report of each inspection. Document deficiencies, remedial action needed and assign responsibility for rectification to appropriate subcontractor or worker.
 - .3 Distribute monthly reports to subcontractors for their pursuance.
 - .4 Follow-up and ensure appropriate action and corrective measures are taken.
- .5 Cooperate with Facility's Health and Safety Site Coordinator responsible for the entire site, should one be designated by Departmental

Representative.

.6 Keep inspection reports on site.

1.13 TRAINING

- .1 Ensure that all workers and other persons granted access to site are competently trained and knowledgeable on:
- .1 Safe use of tools and equipment.
 - .2 How to wear and use personal protective equipment (PPE).
 - .3 Safe work practices and procedures to be followed in carrying out work.
 - .4 Site conditions and minimum safety rules to be observed on site, as given at site orientation session.

1.14 MINIMUM SITE SAFETY RULES

- .1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements to be obeyed by all persons granted site access:
- .1 Wear personnel protective equipment (PPE) appropriate to function and task on site; the minimum requirements being hard hat, safety footwear and eye protection.
 - .2 Immediately report unsafe activity or condition at site, near-miss accident, injury and damage.
 - .3 Maintain site in tidy condition.
 - .4 Obey warning signs and safety tags.
- .2 Brief workers on site safety rules and on disciplinary measures to be taken by Departmental Representative for violation or non-compliance of such rules. Post rules on site.
- .3 The following actions or conduct by Contractor, workers and subcontractors will be considered as non-conformance with the health and safety requirements of the contract for which a Non-Compliance Notification will be issued to the General Contractor by the Departmental Representative:
- .1 Failure to follow the minimum site safety rules specified above.
 - .2 Negligence resulting in serious injury or major property damage.
 - .3 Deliberate non-compliance with Federal and Provincial Acts and Regulations.

- .4 Falsification of information in Workers Compensation Reports, safety reports and other health and safety related documents submitted to Departmental Representative or to Authority having jurisdiction.
 - .5 Possession of firearms on site.
 - .6 Possession of non-prescriptive illegal drugs or alcohol.
 - .7 Action, or lack thereof, resulting in the issuance of Warnings, Fines or Stop Work Orders from a Provincial Authority having jurisdiction.
 - .8 Violation of other specified health and safety rules and requirements as determined by Departmental Representative.
- .4 See elsewhere in this section for details on Non-Compliance Notifications and resulting disciplinary measures.
- 1.15 ACCIDENT REPORTING
- .1 Investigate and report the following incidents and accidents:
 - .1 Those as required by Provincial Occupational Safety and Health Act and Regulations.
 - .2 Injury requiring medical aid as defined in the Canadian Dictionary of Safety Terms-1987, published by the Canadian Society of Safety Engineers (C.S.S.E)as follows:
 - .1 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
 - .3 Property damage in excess of \$5000.00,
 - .4 Interruption to Facility operations with potential loss to a Federal Dept. in excess of \$5000.00,
 - .5 Those which require notification to Workers Compensation Board or other regulatory agencies as stipulated by applicable law or regulations.
 - .2 Send written report to Departmental Representative for all above cases.
- 1.16 TOOLS AND EQUIPMENT SAFETY
- .1 Routinely check and maintain tools, equipment and machinery for safe operation.
 - .2 Conduct checks as part of site safety inspections.

When requested, submit proof that checks and maintenance have been carried out.

- .3 Tag and immediately remove from site items found faulty or defective.

1.17 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).

- .2 Keep MSDS data sheets for all products delivered to site. Post on site. Submit copy to Departmental Representative upon receipt.

- .3 On building renovation projects where work is within or immediately adjacent to occupied areas, also post copy of data sheets in a public location accessible to Facility personnel.

- .4 Existing construction contains asbestos. Abate and manage to applicable codes and standards. Refer also to specification section 02 82 00.02 and Appendix 'A' - Asbestos Management Plan.

1.18 POWDER ACTUATED DEVICES

- .1 Use powder actuated fastening devices only after receipt of written permission from Departmental Representative.

1.19 POSTING OF DOCUMENTS

- .1 Post on site safety documentation as stipulated by Authorities having jurisdiction and as specified herein. Place in a common visible location.

1.20 SITE RECORDS

- .1 Maintain on site a copy of all health and safety documentation and reports specified to be produced as part of the work and received from authorities having jurisdiction.

- .2 Upon request, make available to Departmental Representative and to other authorized safety representative for review. Provide copy when directed by Departmental Representative.

1.21 NON COMPLIANCE AND DISCIPLINARY MEASURES

- .1 Immediately address and correct health and safety violations and non-compliance issues.

- .2 Negligence or failure to follow occupational

health and safety provisions specified in the Contract Documents and of those of applicable federal and provincial laws and regulations could result in disciplinary measures taken by the Departmental Representative against the General Contractor.

- .3 PWGSC uses a system of Non-Compliance Notifications and Disciplinary Measures on projects as follows:
 - .1 A non-compliance notification will be issued to the General Contractor, by the Departmental Representative, whenever there is a violation or failure to follow any of the project's occupational health and safety requirements by a worker, subcontractor or any other person to whom the Contractor has granted access to the work site.
 - .2 Non-Compliance notifications are progressive in nature resulting in increased disciplinary measures imposed depending on the frequency, nature and severity of the infraction.
 - .3 Disciplinary measures could include:
 - .1 Removal of the offending person or party from site;
 - .2 Financial penalties in the form of progress payment reduction or holdback assessments made against the Contract and;
 - .3 Taking the Work Out of Contractor's Hands in accordance with the General Conditions.
- .4 Departmental Representative will make final decision as to what constitutes a violation and when to issue a Non-Compliance Notification.
- .5 Non-compliance Notifications issued by Departmental Representative shall not be construed as to overrule or disregard warnings, orders and fines levied against Contractor by a regulatory agency having jurisdiction.
- .6 Details of the Non-Compliance Notification and Disciplinary Measures system will be provided by Departmental Representative upon acceptance of bid and prior to commencement of work.
- .7 Each non-compliance notification issued is given a numerical rating based on a three level numbering system. Each level is progressive in

nature to reflect:

.1 The seriousness of the infraction as viewed by the Departmental Representative.

.2 The degree of disciplinary action which will be taken by the Departmental Representative.

.8 Numerical ratings are as follows:

.1 Non-Compliance Notification-Level No.1
Rating:

.1 Situation: occurrence of a first time infraction by a person or party on site.

.2 Action: verbal warning to General Contractor, documented in Departmental files and copy sent to the General Contractor.

.2 Non-Compliance Notification-Level No.2
Rating:

.1 Situation:

.1 The second occurrence of a previous infraction by the same person or party on site or;

.2 Accumulation of several level-1 notifications for different infractions by the same person or party on site or;

.3 Non-action on the part of the Contractor or subcontractor to rectify non-compliance infractions previously identified in one or several level-1 notifications or;

.4 Violation or non-observance of a Federal or Provincial safety Law or Regulation by subcontractor or Contractor or;

.5 Negligence by a person or party resulting in injury or major property damage.

.2 Action: written notice to General Contractor complete with an order for immediate remedial action to be taken. Depending on the severity of the offence, the order may include request for the immediate removal of the offending person or party from site.

.3 Non-Compliance Notification-Level No.3
Rating:

.1 Situation:

.1 Continued and repeated

non-compliance with health and safety requirements by the General Contractor or by subcontractor(s) or;

.2 The occurrence of a serious accident on site resulting in serious bodily injury or death.

.2 Action:

.1 Formal letter issued to General Contractor with an order to immediately stop the work until so notified to proceed.

.2 Review of all infractions and incident/accident occurrences with possible investigation by the Department of Public Works & Government Services Canada.

.3 Based on outcome of the review/investigation, Work could be suspended or taken out of the Contractor's hands in accordance with the General Conditions.

.3 The term "serious accident" used herein shall have the same meaning as defined in the Canadian Dictionary of Safety Terms - 1987 issue from the Canadian Society of Safety Engineers (C.S.S.E).

.9 Decision on which rating level to be placed on any given Non-Compliance Notification will be determined solely by Departmental Representative.

.10 Further details on the disciplinary system will be provided at the pre-construction Health and Safety meeting.

.11 Be responsible to fully brief workers and subcontractors on the operation and importance of this system.

<u>Project Name</u> <u>& Description</u>	<u>Start</u> <u>Dates or Months</u>	<u>Completion</u> <u>Duration</u>
-------------------------------------------------	----------------------------------------	--------------------------------------

.1	_____	_____
.2	_____	_____
.3	_____	_____

.6 Departmental Representative will provide full description of Contracts listed above, complete

with drawings and specifications, and name of each
General Contractor prior to commencement of Work
or immediately upon award of future contracts.

- 1.1 RELATED WORK .1 Waste Management and Disposal: Section 01 74 21.
.2 Asbestos Abatement: section 02 82 00.02.
.3 Appendix 'A' - Asbestos Management Plan.
- 1.2 DEFINITIONS .1 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- 1.3 FIRES .1 Fires and burning of rubbish on site not permitted.
- 1.4 HAZARDOUS MATERIAL HANDLING .1 Store and handle hazardous materials in accordance with applicable federal and provincial laws, regulations, codes and guidelines. Store in location that will prevent spillage into the environment
.2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.
.3 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.
.4 Store and handle flammable and combustible materials in accordance with National Fire Code.
.5 Transport hazardous materials in accordance with federal Transportation of Dangerous Goods Regulations and applicable Provincial regulations.
- 1.5 DISPOSAL OF WASTES .1 Do not bury rubbish and waste materials on site. Dispose in accordance with project waste management requirements specified.
.2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, paints,

thinners, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.

- .3 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.

1.6 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features during this contract.
- .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.
- .5 Have appropriate emergency spill response equipment and rapid clean-up kit on site located adjacent to hazardous materials storage area. Provide personal protective equipment required for clean-up.

Security, issued to Contractor for distribution to authorized workers which shall also be placed on the Security Control List specified below.

.3 All persons while on site, must wear the ID Tag issued to him regardless of daytime or nighttime work.

.4 Be responsible to obtain ID Tags before work commences, including those required by subcontractors, and continually control their distribution and use by workers. Submit request for tags as early as possible prior to commencement of work.

.5 For the duration of this contract, anyone not in possession of the ID Tag will not be allowed access on site.

.6 At end of project, return to Departmental Representative all tags issued to workers and to subcontractors.

.1 The Departmental Representative will levy a financial penalty in the form of a holdback assessment against the Contract for each pass not returned regardless of the reason the pass is not returned.

.7 Immediately report any lost, stolen or destroyed ID Tags to the Departmental Representative.

1.4 SECURITY CONTROL LIST

- .1 Provide a list of employee names from workforce and from subcontractors who will be present at site during the course of work.
- .2 List to include each person's name, address and telephone number.
- .3 Submit copy of list to Departmental Representative and to Security Commissionaire for control of workers.
- .4 Update list as work progresses.
- .5 Ensure that each worker can provide proof of identity upon demand, when requested by Facility's Security Personnel, Departmental Representative or by Facility Management.

1.5 BUILDING ACCESS

- .1 Keys and door security access cards necessary for access to restricted areas may be issued at the discretion of the Building Manager and the Departmental Representative. Follow all instructions in regards to use, care and disposition of all keys and access cards so issued.
- .2 Keys and security access cards given to the Commissionaire for his sole possession, as determined by Departmental Representative, shall not under any circumstances be given to any worker or subcontractor.
- .3 Do not, under any circumstances, make or allow workers to make duplicates of keys issued.
- .4 At end of project, return to Departmental Representative all keys and access cards issued. Departmental Representative will deduct from final contract payment, \$25.00 for each item not returned, regardless of the reason.
- .5 Immediately report to Departmental Representative any lost, stolen or destroyed keys and door security access cards.

1.6 SITE SECURITY

- .1 Where work of this contract requires use of a permanently locked door, it is Contractor's responsibility to ensure that door is unlocked and locked after each use or provide a competent security guard, posted at door, when door must remain open for an elongated period of time during a particular workshift.
 - .1 Notify Building Security when security doors will be used and stringently follow all directives to ensure building security is effectively maintained.
- .2 When work must be carried out during Off Hours or beyond the work hours previously agreed upon at start of work; provide notice within 48 hours beforehand to minimize impact on Facility's security and tenant operations.
- .3 Off Hours are defined in section 01 14 10.

1.1 INSPECTION

- .1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.
- .3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed.
- .4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.2 TESTING

- .1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
 - .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.
- .2 At completion of tests, turn over 2 sets of fully documented tests reports to the Departmental Representative. Submit in accordance with Section 01 33 00.
 - .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals specified in Section 01 78 00.
- .3 Unspecified tests may also be made by Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.
- .4 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections incurred by Departmental Representative as required to verify acceptability of corrected work.

1.3 INDEPENDENT
INSPECTION AGENCIES

- .1 Departmental Representative may engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of mechanical and electrical equipment and other building systems.
 - .4 Performance verification tests before building commissioning procedures commences.
 - .5 Mill tests and certificates of compliance.
 - .6 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
 - .7 Air quality monitoring and testing during hazardous materials abatement.
 - .8 Additional tests as specified in Clause 1.3.4 above.
- .2 Provide sufficient advance notice to Departmental Representative of time when the Work will be ready for testing by designated Testing Agency in order for Departmental Representative to make attendance arrangements with such Agency. When directed by Departmental Representative notify the Agency directly.
- .3 When specified or directed, submit Representative samples of materials, in required quantities, to Testing Agency for testing purposes. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .4 Provide labour and facilities to obtain, handle and deliver samples.
- .5 Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.
- .6 Employment of Independent Inspection and Testing Agencies by Departmental Representative does not relax responsibility to perform Work in

accordance with Contract Documents.

1.4 ACCESS TO WORK

- .1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.
- .2 Furnish labour and facility to provide access to the work being inspected and tested.
- .3 Co-operate to facilitate such inspections and tests.

1.5 REJECTED WORK

- .1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.
- .2 Make good damages to new and existing construction and finishes resulting from removal or replacement of defective work.

1.6 MOCK-UPS

- .1 Prepare mock-ups of certain work as specified in various sections of the Specifications. Include in each mock-up all related work components representative of final assembly.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock-ups 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.
- .5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.

-
- .6 Dismantle and remove mock-up when directed by
Departmental Representative, unless approval is
given for mock-up to remain as part of the Work.

-
- 1.1 SITE ACCESS AND PARKING
- .1 The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.
 - .2 The Contractor is advised that while parking facilities for his workers and subcontractors MAY be on property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regards to parking facilities. Availability of on-site parking is not, however guaranteed.
- 1.2 BUILDING ACCESS
- .1 Use only access doors, and circulation routes within building as designated by Departmental Representative to access interior work.
- 1.3 MATERIAL STORAGE
- .1 Locate site storage trailers where directed by Departmental Representative. Place in location of least interference with existing Facility operations.
 - .2 Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work. Storage within the building is not available.
- 1.4 INTERIOR HOARDING
- .1 Erect hoarding inside building to isolate construction areas, protect occupants and public and maintain security for duration of work.
- 1.5 INTERIOR DUST CONTROL AND DUST BARRIERS
- .1 Control creation and spread of dust and dirt to building interior and in particular to areas within premises still under use by occupants.
 - .2 Develop and implement a dust control plan, addressing effective measures to carry out work with least amount of dust being created and propagated.
 - .1 Carefully evaluate the type of work to be undertaken and the physical layout of each work area on site.
 - .2 Provide specifically tailored strategy for each work area.

- .3 Pre-determine location and placement of dust barriers to confine resulting dust to immediate work area.
 - .4 Inform Departmental Representative of the proposed dust control measures to be followed at each work area and for each major dust generating activities. Obtain Departmental Representative's approval before proceeding with work.
- .3 Dust control plan to incorporate as a minimum the following dust protection and cleaning requirements:
- .1 Erect dustproof partitions in addition to construction hoarding specified in 1.4 above completely around work area to fully isolate construction from other parts of the building
 - .1 Erect from floor to underside of ceiling above, sheeting applied to occupied side of partition.
 - .2 Scribe, cut and fit sheathing tight to shape of structural steel, deck profile and to other obstructions in ceiling space and abutting walls.
 - .3 Use compressible neoprene gaskets around perimeter of partition and at all protrusions to achieve airtight construction.
 - .4 Where partition is exposed to public view, tape and finish drywall joints and paint surface to color approved by the Departmental Representative.
 - .3 Provide a "dust tight" and lockable access door(s) within dust partition or between rooms for worker entry into work area. This is of particular importance for situations where excessive dust will be generated.
 - .4 Provide additional dust barriers, placed tightly to underside of the floor/roof deck above, in locations where existing walls are used as part of the dust barrier system but simply terminate at the finished ceiling level resulting in an open space above, or other similar condition, permitting dust to migrate beyond the construction areas.
 - .5 Make all dust barriers airtight, effectively blocking and stopping all dust migration.
 - .6 Inspect dust barriers at various intervals during each work shift. Immediately fix tears,

unsealed edges and maintain barriers effectively sealed for the entire work duration.

.7 Shut down existing ventilation system feeding construction space, or disconnect and seal-off supply and return air ducts to stop dust from contaminating other areas.

.8 Immediately clean areas in use by occupants and public contaminated by work.

.1 Vacuum carpets, wash floors and walls. Remove accumulated dust from all surfaces. Clean and remove smears, scuffs and marks.

.4 Meager attempts at controlling dust will not be tolerated. Failure to provide effective dust control during work and to perform satisfactory cleaning thereafter will result in Departmental Representative to proceed and obtain a separate cleaning service agency to perform cleaning to tenant's satisfaction with cost for such services being charged against this Contract in the form of financial holdbacks.

.5 Obtain Departmental Representative's approval before erecting any dust partitions simply to underside of finish ceiling.

.6 Construction of dust barriers, enclosures and placement of temporary protective devices to be performed during Facility non-operational off-hour periods.

1.6 SANITARY FACILITIES

.1 Sanitary facilities are available at the site and may be used by Contractor's work force. Make arrangements for the use of such facilities through the Departmental Representative.

1.7 POWER

.1 Power supply is available and will be provided for construction usage at no cost.

.1 Make arrangements for the use of such services through the Departmental Representative.

.2 Departmental Representative will designate and approve each location of existing power source to which connections can be made to obtain temporary power service.

.3 Connect to existing power supply in accordance with Canadian Electrical Code.

.2 Provide and pay all costs to supply and install

temporary cabling, panel boards, switching devices and other equipment as required to connect into power source, provide adequate ground fault protection and extend power supply from existing source to work areas. Perform work and make all connections in accordance with the Canadian Electrical Code, in compliance with the federal and provincial Occupational Health and Safety Regulations as specified in section 01 35 28 and to lockout requirements specified in section 01 35 25.

- .3 Provide and maintain temporary lighting to conduct work. Ensure illumination level is not less than 162lx in all locations.
- .4 Electrical power and lighting systems installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage. Replace lamps which have been used over period of 3 months.

1.8 WATER SUPPLY

- .1 Water supply is available in existing building and will be provided for construction usage at no cost. Make arrangements for the use and transportation of such services to work area through the Departmental Representative.
- .2 Permanent water supply system installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage.

1.9 SCAFFOLDING
(if required)

- .1 Design, construct and maintain scaffolding in rigid, secure and safe manner in accordance with CAN/CSA-S269.2-M87(R2003).
- .2 Erect scaffolding independent of walls. Remove when no longer required.

1.10 HEATING AND
VENTILATING

- .1 Provide temporary ventilation in enclosed areas as required to:
 - .1 Facilitate progress of work.
 - .2 Provide adequate ventilation to meet health regulations for safe working environment.
- .2 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during

-
- construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .3 Maintain strict supervision of operation of temporary ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .4 Submit bid assuming existing or new equipment and systems will be used for temporary heating.
 - .5 Upon acceptance of bid, Departmental Representative may permit use of permanent system providing agreement can be reached on:
 - .1 Conditions of use, special equipment, protection and maintenance.
 - .2 Saving on Contract price.
 - .3 Provisions relating to warranties on equipment.
- 1.11 CONSTRUCTION SIGN AND NOTICES
- .1 Safety and Instruction Signs and Notices:
 - .1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols conforming to CAN3-Z321-96(R2006).
 - .2 Maintenance and Disposal of Site Signs:
 - .1 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 Departmental Representative.
- 1.12 REMOVAL OF TEMPORARY FACILITIES
- .1 Remove temporary facilities from site when directed by Departmental Representative.

1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 7 days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
 - .1 Name and address of manufacturer.
 - .2 Trade name, model and catalogue number.
 - .3 Performance, descriptive and test data.
 - .4 Compliance to specified standards.
 - .5 Manufacturer's installation or application instructions.
 - .6 Evidence of arrangements to procure.
 - .7 Evidence of manufacturer delivery problems or unforeseen delays.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.2 PRODUCT QUALITY

- .1 Contractor shall be solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.
- .2 Final decision as to whether a product or system meets contract requirements rest solely with the Departmental Representative in accordance with the General Conditions of the Contract.

1.3 ACCEPTABLE MATERIALS AND ALTERNATIVES

- .1 Acceptable Materials: When materials specified include trade names or trademarks or manufacturers or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.

- .2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.
- .3 Substitutions: After contract award, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

1.4 MANUFACTURERS
INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions, so that Departmental Representative will designate which document is to be followed.

1.5 AVAILABILITY

- .1 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per clause 1.1.2 above.

1.6 WORKMANSHIP

- .1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.
- .2 Remove unsuitable or incompetent workers from site as stipulated in the General Conditions of the Contract.
- .3 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.
- .4 Coordinate work between trades and subcontractors. See section 01 14 10 in this regard.
- .5 Coordinate placement of openings, sleeves and accessories.

1.7 FASTENINGS -
GENERAL

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work and in humid areas.
- .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.
- .3 Keep exposed fastenings to minimum, space evenly and lay out neatly.
- .4 Fastenings which cause spalling or cracking of material, to which anchorage is made are not acceptable.
- .5 Do not use explosive actuated fastening devices unless approved by Departmental Representative. See section on Health and Safety Requirements in this regard.

1.8 FASTENINGS -
EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and, use resilient washers with stainless steel.

1.9 STORAGE,
HANDLING AND
PROTECTION

- .1 Deliver, handle and store materials in manner to prevent deterioration and soiling and in accordance with manufacturer's instructions when applicable. Provide same degree of protection to materials supplied by Departmental Representative.
- .2 Store packaged or bundled materials in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging

or bundling until required in Work. Provide additional cover where manufacturer's packaging is insufficient to provide adequate protection.

- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Immediately remove damaged or rejected materials from site.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.10 CONSTRUCTION
EQUIPMENT AND PLANT

- .1 On request, prove to the satisfaction of Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .2 Maintain construction equipment and plant in good operating order.

1.1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered locked metal containers, and remove from premises at end of each working day.
- .3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

1.2 MATERIALS

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

1.3 CLEANING DURING CONSTRUCTION

- .1 Maintain work areas and occupied area in a clean, tidy condition, free from accumulations of waste material dust, dirt and debris. Clean areas on a daily basis.
- .2 Keep building entrances, corridors, stairwells and occupied areas of building in a clean dust free condition at all times. Conduct thorough cleaning of these areas at end of each workshift when used by workers or affected by the Work.
- .3 Provide on-site covered, locked steel containers for collection of waste materials and debris.
- .4 Use separate collection bins, clearly marked as to purpose, for source separation and recycling of waste and debris in accordance with waste management requirements specified.
- .5 Remove waste materials, and debris from site on a daily basis.
- .6 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .7 Provide dust barriers, dividers, seals on doors and employ other dust control measures as required to ensure that dust and dirt, generated by work,

are not transmitted to other existing areas of building. Should dust migrate into occupied areas of building, employ such means as may be necessary to immediately clean all contaminated surfaces to the satisfaction of the Departmental Representative.

.1 See Section 01 50 00 for requirements on dust control and for erection of dust partitions.

.8 Immediately clean all dust, dirt, smears, scuffs and soiled surfaces in lobbies, corridors, and within tenant occupied areas resulting from the Work.

.1 Perform cleaning, dusting and washing operations, and floor washing as necessary to thoroughly clean all soiled surfaces.

1.4 FINAL CLEANING

.1 In preparation for acceptance of the completed work perform final cleaning.

.2 Remove grease, dust, dirt, stains, labels, fingerprints, marks and other foreign materials, from interior and exterior finished surfaces. Clean and polish surfaces including glass, mirrors, hardware, wall tile, stainless steel, chrome, baked enamel, plastic laminate, mechanical and electrical fixtures.

.3 Replace items with broken pieces, scratches or disfigured.

.4 Clean lighting reflectors, lenses, and other lighting surfaces.

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

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

.7 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.

.8 Clean equipment, washroom fixtures to a sanitary condition. Replace filters of mechanical equipment.

- 1.1 RELATED WORK
 - .1 Environment Procedures: Section 01 35 43.
 - .2 Asbestos Abatement: Section 02 82 00.02.
 - .3 Appendix 'A' - Asbestos Management Plan.

- 1.2 GENERAL
 - .1 Carry out work placing maximum emphasis on the areas of:
 - .1 Waste reduction;
 - .2 Diversion of waste from landfill and;
 - .3 Material Recycling.

- 1.3 WASTE MANAGEMENT PLAN
 - .1 Prior to commencement of work, prepare waste Management Workplan.
 - .2 Workplan to include:
 - .1 Waste audit.
 - .2 Waste reduction practices.
 - .3 Material source separation process.
 - .4 Procedures for sending recyclables to recycling facilities.
 - .5 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site.
 - .6 Training and supervising workforce on waste management at site.
 - .3 Workplan to incorporate waste management requirements specified herein and in other sections of the Specifications.
 - .4 Develop Workplan in collaboration with all subcontractors to ensure all waste management issues and opportunities are addressed.
 - .5 Submit copy of Workplan to Departmental Representative for review and approval.
 - .1 Make revisions to Plan as directed by Departmental Representative.
 - .6 Implement and manage all aspects of Waste Management Workplan for duration of work.
 - .7 Revise Plan as work progresses addressing new opportunities for diversion of waste from landfill.

1.4 WASTE AUDIT

- .1 At project start-up, conduct waste audit of:
 - .1 Site conditions identifying salvageable and non-salvageable items and waste resulting from demolition and removal work.
 - .2 Projected waste resulting from product packaging and from material leftover after installation work.
- .2 Develop written list. Record type, composition and quantity of various salvageable items and waste anticipated, reasons for waste generation and operational factors which contribute to waste.

1.5 WASTE REDUCTION

- .1 Based on waste audit, develop waste reduction program.
- .2 Structure program to prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.
- .3 Identify materials and equipment to be:
 - .1 Protected and turned over to Departmental Representative when indicated.
 - .2 Salvaged for resale by Contractor.
 - .3 Sent to recycling facility.
 - .4 Sent to waste processing/landfill site for their recycling effort
 - .5 Disposed of in approved landfill site.
- .4 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of new materials on site, such as:
 - .1 Use of a central cutting area to allow for easy access to off-cuts;
 - .2 Use of off-cuts for blocking and bridging elsewhere.
 - .3 Use of effective and strategically placed facilities on site for storage and staging of left-over or partially cut materials (such as gypsum board, plywood, ceiling tiles, insulation etc...) to allow for easy incorporation into work whenever possible avoiding unnecessary waste.
- .5 Develop other strategies and innovative procedures to reduce waste such as minimizing the

extent of packaging used for delivery of materials to site etc.

1.6 MATERIAL SOURCE SEPARATION PROCESS

- .1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site.
- .2 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
 - .1 Use suitable containers for individual collection of items based on intended purpose.
 - .2 Locate to facilitate deposit but without hindering daily operations of existing building tenants.
 - .3 Clearly mark containers and stockpiles as to purpose and use.
- .3 Perform demolition and removal of existing building components and equipment following a systematic deconstruction process.
 - .1 Separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:
 - .1 Reinstallation into the work where indicated.
 - .2 Salvaging reusable items not needed in project which Contractor may sell to other parties. Sale of such items not permitted on site.
 - .3 Sending as many items as possible to locally available recycling facility.
 - .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.
- .4 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.
- .5 Send leftover material resulting from installation work for recycling whenever possible.
- .6 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course work are properly isolated, stored on site and disposed in accordance with applicable laws and

regulations from authorities having jurisdiction.

- .7 Isolate and store existing materials and equipment identified for re-incorporation into the Work. Protect against damage.

1.7 WORKER TRAINING AND SUPERVISION

- .1 Provide adequate training to workforce, through meetings and demonstrations, to emphasize purpose and worker responsibilities in carrying out the Waste Management Plan.
- .2 Waste Management Coordinator: designate full-time person on site, experienced in waste management and having knowledge of the purpose and content of Waste Management Plan to:
 - .1 Oversee and supervise waste management during work.
 - .2 Provide instructions and directions to all workers and subcontractors on waste reduction, source separation and disposal practices.
- .3 Post a copy of Plan in a prominent location on site for review by workers.

1.8 CERTIFICATION OF MATERIAL DIVERSION

- .1 Submit to Departmental Representative, copies of certified weigh bills from authorized waste processing sites and sale receipts from recycling/reuse facilities confirming receipt of building materials and quantity of waste diverted from landfill.
- .2 Submit data at pre-determined project milestones as determined by Departmental Representative.
- .3 Compare actual quantities diverted from landfill with projections made during waste audit.

1.9 DISPOSAL REQUIREMENTS

- .1 Burying or burning of rubbish and waste materials is prohibited.
- .2 Disposal of waste, volatile materials, mineral spirits, oil, or paint thinner into waterways, storm, or sanitary sewers is prohibited.
- .3 Dispose of waste only at approved waste processing facility or landfill sites approved by authority

having jurisdiction.

- .4 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.
- .5 Transport waste intended for landfill in separated condition, following rules and recommendations of Landfill Operator in support of their effort to divert, recycle and reduce amount of solid waste placed in landfill.
- .6 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.
- .7 Sale of salvaged items by Contractor to other parties not permitted on site.

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- 1.1 SECTION
INCLUDES
- .1 Administrative procedures preceding inspection and acceptance of Work by Departmental Representative.
- 1.2 RELATED
SECTIONS
- .1 Section 01 78 00 - Closeout Submittals.
- 1.3 INSPECTION AND
DECLARATION
- .1 Contractor's Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.
- .1 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's inspection of the completed work.
- .2 Departmental Representative's Inspection: Accompany Departmental Representative during all substantial and final inspections of the Work.
- .1 Address defects, faults and outstanding items of work identified by such inspections.
- .2 Advise Departmental Representative when all deficiencies identified have been rectified.
- .3 Note that Departmental Representative will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:
- .1 Project record as-built documents;
- .2 Final Operations and Maintenance manuals;
- .3 Maintenance materials, parts and tools;
- .4 Compliance certificates from applicable authorities;
- .5 Reports resulting from designated tests;
- .6 Demonstration and training complete with user manuals;
- .7 Manufacturer's Guarantee certificates.
- .8 Testing, adjusting and balancing of equipment and systems complete with submission of test reports.
- .9 Commissioning of equipment and systems

specified.

- .4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.

1.1 GENERAL

- .1 Submit closeout documents specified in this section prior to application for Certificate of Substantial Performance of the Work.
- .2 Submit data in sufficient lead time to allow adequate review by Departmental Representative.
- .3 Make revisions to data as directed by Departmental Representative based on review.

1.2 PROJECT RECORD DOCUMENTS

- .1 Departmental Representative will provide 2 white print copies of contract drawings specifically to record "as-built" conditions.
- .2 Maintain 1 set at site and record actual built conditions.
- .3 Mark each drawing with up-to-date, real time as-built conditions as work progresses.
- .4 Maintain drawings in good condition and make available for inspection by the Departmental Representative whenever requested.
- .5 Record changes in red ink on the prints. Mark only on 1 set of drawings and transfer data to other set at completion of project.
 - .1 Neatly transfer notations to second set also by use of red ink.
 - .2 Stamp all drawings of both sets with the notation "As-Built Drawings". Also sign and date drawings.
 - .3 Indicate all modifications, substitutions and deviations from that shown on the Contract Drawings or in Specifications.
- .6 Record following information:
 - .1 Field changes to dimensions and details;
 - .2 Any additional details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;
 - .3 All Change Orders issued, documenting accurately and consistently the changed condition as it applies to all affected drawing details.
- .7 Maintain As-built documents current as the contract progresses.
- .8 Submit both sets of as-builts drawings.

1.3 OPERATIONS &
MAINTENANCE DATA

- .1 Submit 3 copies of Operations and Maintenance (O&M) manual(s).
- .2 O&M manuals to be hard cover three ring binder for 215 x 280 mm size paper. Each copy shall contain:
 - .1 Technical data for installation, operations and maintenance of products and systems supplied in project.
 - .2 Nameplate information for mechanical and electrical equipment.
 - .3 List of spare parts and tools.
 - .4 Original or certified copy of warranties and manufacturer's product guarantees.
 - .5 Reports of any field test.
 - .6 Complete set of reviewed shop drawings.
- .3 Provide cover sheet in each manual with:
 - .1 Project name and number
 - .2 Name and address of Contractor and subcontractors
 - .3 Date of submission
 - .4 Table of contents
- .4 Manuals to be in English language.

1.4 TOOLS AND
PARTS

- .1 Supply special tools, wrenches and spare parts as supplied by manufacturer to disassemble, remove and reinstall components as needed for maintenance purposes.
- .2 Tag all items with name of associated equipment and function.
- .3 Turn items over to Departmental Representative immediately upon completion of work.
- .4 Where required, provide manufacturer's written instructions on intent and method of use.
- .5 Provide name, address and telephone number of nearest supplier.
- .6 Prepare and include complete inventory list of items supplied into the maintenance manuals.

1.5 CONDITIONS FOR
DEMONSTRATIONS

- .1 Prior to carrying out demonstration and training, ensure that equipment has been inspected and tested, is fully operational, has been performance verified and TAB has been carried out.
- .2 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.6 PREPARATION

- .1 Verify that conditions for demonstration and instructions comply with requirements.
- .2 Verify that designated personnel are present.

1.7 DEMONSTRATION
AND INSTRUCTIONS

- .1 Include the following items within the demonstration and training:
 - .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each of equipment.
 - .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
 - .3 Review contents of manual in detail to explain all aspects of operation and maintenance.
 - .4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.
 - .5 Provide other specific training and instructions as specified in trade sections.

1.8 TIME ALLOCATED
FOR INSTRUCTIONS

- .1 Observe the allocated time period specified in trade sections. Provide additional time when required to ensure all personnel fully understand all aspects of the information and instructions being provided. Allow for questions by participants.

1.1 SECTION
INCLUDES

- .1 This section deals with commissioning activities to occur during the construction stage and the early period of facility occupancy stage.
- .2 Section includes:
 - .1 Commissioning activities to be performed by the Contractor who is assigned membership on a Commissioning Team as part of the contract requirements.
 - .2 Commissioning activities to be performed by other members of the Commissioning Team.
- .3 In general, Contractor's commissioning activities consists of performing specified tasks and functions to assist the Commissioning Agent, along with other members of the commissioning team who will commission various components and systems of the Facility.

1.2 RELATED
SECTIONS

- .1 Operations and Maintenance Manuals: Section 01 78 00.
- .2 Demonstration and Training: Section 01 79 00

1.3 BACKGROUND
INFORMATION

- .1 Historically in the past, the term commissioning has been used in reference to the process used to conduct testing, adjusting and balancing of the heating, ventilation and air conditioning (HVAC) systems of a building.
- .2 Commissioning (or the commissioning process), as understood by PWGSC, is a planned program of activities conducted in concert with other activities performed during each stage of project delivery.
 - .1 The commissioning process identifies issues during the Planning and Design stages which are addressed during the Construction and Occupancy Stages of a Facility to ensure that the built facility is constructed and proven to operate satisfactorily under all weather, environmental and occupancy conditions to meet operational and user requirements.
 - .2 Commissioning activities during the Construction stage incorporates a third party verification process and a transfer of critical operational knowledge to Facility personnel.

1.4 COMMISSIONING
OBJECTIVES

- .1 A Commissioning Plan will be prepared by the Design Consultant, on behalf of PWGSC, which identifies, among other issues, specific commissioning activities to be carried out by the commissioning team during the Construction and Occupancy Stages of the project.
- .2 The commissioning activities have the following objectives:
 - .1 Collect data on equipment and systems being supplied and document their installation;
 - .2 Conduct checks and tests on fully installed building components, equipment, systems and integrated systems to:
 - .1 Verify whether they operate in accordance with requirements of Contract Documents;
 - .2 Verify performance against design criteria and user requirements and measure peak capacities;
 - .3 Prepare a Building Management Manual (BMM) which contains operations and maintenance data, as-built record documents, commissioning reports, training data and other critical information for future use by Facility operational staff;
 - .4 Ensure transfer of knowledge on the operations, maintenance and management of the Facility to Tenant and Operational personnel by means of appropriate training.
- .3 Work to achieve the above objectives requires a collaborative effort from all members of the commissioning team.
 - .1 Contractor's commissioning activities and responsibilities are described in Clause 1.8 below.
- .4 Commissioning activities performed by the Commissioning Agent and the Design Consultant does not replace checks, tests, adjustments, balancing and other performance verification procedures to be carried out by the Contractor as an integral part of performing the Work of this contract as specified in other sections of the Specifications.

1.5 SYSTEMS TO BE
COMMISSIONED

- .1 The following systems and controls, complete with associated equipment and components, will be commissioned and requires related commissioning activities to be performed by Contractor as specified herein and in section(s):
 - .1 Mechanical
 - .2 Electrical
 - .3 Millwork
 - .4 Finishes

1.6 DEFINITIONS

- .1 For the purpose of this contract, the various terms listed below, as they relate directly or indirectly to the commissioning process, shall be deemed to have the following meaning.
- .2 Commissioning Process: a planned program of tasks, activities and procedures carried out systematically during the Construction and Occupancy Stages in accordance with the commissioning objectives, specified in clause 1.4.2 above, to:
 - .1 Verify whether the fully installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and;
 - .2 Ensure that appropriate documentation is compiled to effectively train O& M staff and prepare a comprehensive Building Management Manual (BMM).
- .3 Commission (ie: to commission a building component or system): tests and checks conducted by Commissioning Agent on all systems and integrated systems of Facility; carried out only after they are fully installed, functional and Contractor's Performance Verification responsibilities have been completed and approved.
 - .1 Contractor provides assistance during this process by operating equipment and systems, by troubleshooting and making adjustments as may be required.
 - .2 Systems are run under their full operation and under various modes to determine if they function correctly, consistently, at peak efficiency and interactively with each other as intended in accordance with Contract Documents

and design criteria.

.3 During these checks, adjustments may be made enhancing performance to meet environmental or user requirements.

.4 Commissioning Manager: a AAFC departmental employee providing advice and guidance on commissioning requirements to the Commissioning Agent in support to the Departmental Representative.

.5 Commissioning Plan: The document which describes the organization, scheduling, allocation of resources, required documentation, target dates, and team roles and responsibilities for verification that the built works meet Contract Document and design criteria requirements.

.6 Contractor: means the General Contractor, however it also refers to any personnel from subcontractors, including the controls and TAB specialists, suppliers and manufacturer's technical persons which Contractor employs to carry out his/her designated commissioning duties and activities.

.7 Design Consultant: persons from the, architectural, mechanical and electrical design disciplines of the engineering firm(s) which have been engaged by the Departmental Representative to prepare the final design and produce the contract documents. Design Consultant also has specifically identified commissioning activities for this project.

.8 Design Criteria: All those factors included in the design of a Facility prescribed by the tenant needs or as determined by Designer as necessary in order to meet all Facility functional and user operational requirements

.9 Installation/Start-up Checks: (sometimes referred to as pre-functional checks) A written compilation of checks and inspections to be performed by Contractor during the pre-start-up and start-up of a particular equipment or system component.

.1 Checklist sheets are produced which include the following data:

.1 Product manufacturer's installation instructions and recommended checks and;

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- .2 Special procedures as specified in relevant sections of Specifications;
 - .3 Other items considered good installation and engineering industry practices deemed appropriate for proper and efficient operation.
 - .2 Standard Installation/Start-up Checklist sheets prepared by equipment manufacturer are acceptable for use. However, supplement with additional data representative of specific project conditions as deemed required by Commissioning Agent.
 - .3 Use Checklist sheets for all equipment installation. Document in writing on checklist the various checks made, deficiencies noted and corrective action taken.
 - .4 Installer to sign Checklist sheets upon completion, certifying that stated checks and inspections have been performed.
 - .5 Use of Installation/Start-up Checklists shall not be considered part of the commissioning process but shall be stringently used for all equipment pre-start and start-up procedures.
 - .6 Return completed Installation/Start-up Checklist sheets after use to Commissioning Agent for retention. Checklists are required by Commissioning Agent when Facility is commissioned and will be included in the BMM manual at completion of project.
- .10 Performance Verification: (sometimes referred to Functional Testing) checks, running dynamic tests and adjustments carried out by Contractor on equipment and systems, upon their installation, to ensure they operate correctly, efficiently and function independently and interactively with other systems as intended in accordance with contract documents and manufacturer's recommendations.
- .1 Performance Verification shall not be considered part of the commissioning process. It is however considered an essential and integral part of Contractor's responsibilities in the equipment installation process which must be stringently conducted, successfully completed and approved by Departmental Representative before a piece of equipment or system is considered fully installed and functional.
 - .2 Facility components and systems will not be commissioned by Commissioning Agent until performance verification has been completed and

approved.

- .11 Performance Verification Report Sheets (PV sheets): forms developed by Commissioning Agent for Contractor's use to record measured data and readings taken during functional testing and Performance Verification procedures.
- .12 Product Information (PI Data): a compilation of data gathered on a particular piece of equipment, typically produced by manufacturer, which includes nameplate information, installation/startup instructions, parts list, operating instructions, maintenance guidelines and other pertinent technical data and recommended checks that is necessary to prepare for start-up and functional testing and used during operation and maintenance of such equipment. This documentation is included in the Building Management Manual (BMM) at completion of work.

1.7 COMMISSIONING TEAM

- .1 A commissioning team will be assembled to carryout various functions needed to effectively commission the Facility. Contractor shall be part of this team with duties and responsibilities as specified in this section and in other sections of the Specifications.
- .2 Members of the Commissioning Team are as follows:
 - .1 Design Consultants
 - .2 Contractor
 - .3 Contractors Commissioning Supervisor
 - .4 Agriculture & Agri-Food Canada Commissioning Manager
 - .5 Agriculture & Agri-Food Canada departmental personnel providing advice and project quality control to Departmental representative when required.
 - .6 Facility's operation and maintenance personnel staff as identified by Departmental Representative.
- .3 Effective commissioning requires coordination between members of the commissioning team. Cooperate with other team members in fulfilling assigned duties and as follows:
 - .1 Communicate commissioning objectives, to subcontractors, suppliers and manufacturers.
 - .2 Coordinate activities between

subcontractors and trades as needed to carryout Contractor's assigned commissioning activities.

.3 Ensure attendance of subcontractors and required specialist at commissioning meetings and during the commissioning process.

.4 Construction Commissioning Supervisor:

.1 Assign a person, under Contractor's employ, to be the Construction Commissioning Supervisor.

.2 Person to be knowledgeable and have past experience in commissioning of mechanical and electrical systems. Submit affidavit confirmation person's qualifications for Departmental Representative's review and approval.

.3 Construction Commissioning Supervisor to coordinate and oversee all work activities and input required from subcontractors and applicable trades as required to make equipment, subsystems and system ready for commissioning and to conduct commissioning duties assigned to the Contractor.

.4 Construction Commissioning Supervisor shall:

.1 Be the main point of contact, representing the Contractor, with whom the Commissioning Agent and Departmental Representative will to deal with in matters relating to commissioning.

.2 Attend all commissioning meetings and ensure that appropriate persons from subcontractors, trades, suppliers and manufacturers attend meetings when deemed required by Commissioning Agent or Departmental Representative.

1.8 CONTRACTOR'S
COMMISSIONING
ACTIVITIES

.1 General:

.1 Organize and arrange for the services of subcontractors, their specialists and manufacturer's technical representatives to perform Contractor's commissioning activities

.2 Ensure that personnel forming part of the Commissioning Team are qualified and knowledgeable of installed equipment and systems and with design intent.

.3 Develop in conjunction with the Commissioning Agent a commissioning schedule as specified in clause 1.11.

.4 Notify Departmental Representative in writing when Facility is ready for be commissioned. Give 14 calendar day notice.

.5 Commissioning will only commence once that full documentation has been received and installed equipment and systems have undergone successful performance verification.

.6 Note that Certificate of Substantial Completion will only be issued when:

.1 All commissioning documentation has been received and found suitable by Departmental Representative;

.2 Designated equipment and systems have been commissioned and;

.3 Training has been completed.

.7 Performance faults:

.1 Equipment and systems found not operating correctly or not performing as intended during commissioning shall be re-verified by checking 100% of all equipment and components of the unfunctional system, including related controls as required to rectify the deficiencies and ensure correct performance.

.2 Costs to conduct additional tests and inspections, as deemed required by Departmental Representative, to determine acceptability and proper performance of such item to be paid for by Contractor.

.2 Prior to Facility being Commissioned:

.1 Submit commissioning documentation as specified in clause 1.13 below.

.2 Submit the Installation/Start-up Checklist sheets to Commissioning Agent for review prior to conducting the pre-start and start-up of any piece of equipment. Incorporate additional start-up instructions onto checklist as determined by the Commissioning Agent's review.

.3 Conduct the pre-start and start-up of all equipment by following and filling out the approved Installation/Start-up Checklists.

.4 Conduct Performance Verification on all installed equipment and systems. Use and fill out the PV Report Sheets provided.

.5 Upon completion of start-up and performance verification process, submit signed copy of Checklist and PV sheets to Commissioning Agent as affidavit that required checks and tests were successfully conducted.

.6 Record performance measurements and data reading on PV sheets and return to Commissioning Agent for compilation.

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- .7 Give Departmental Representative and Design Consultants a minimum of 5 days' notice for start-up and performance verification of equipment and systems which must be witnessed by Departmental Representative as determined by Design Consultants beforehand on PV sheets.
 - .8 Provide missing information and data as identified by Commissioning Agent and Departmental Representative during documentation review.
 - .9 Submit above noted documentation before Commissioning will proceed.
 - .10 Address deficiencies in Work identified during performance verification of equipment and systems. Conduct additional performance verification thereafter.
 - .11 Arrange for special tools and devices, identified at commissioning meeting(s), as deemed required to assist with commissioning.
 - .12 Provide access ladders, two way radios and other equipment required by Team when facility will be commissioned.
- .3 When Facility is being Commissioned:
- .1 Provide qualified tradespersons to be present at site to assist Commissioning Agent for the time period and commissioning activity specified.
 - .2 Assist in commissioning architectural building component, mechanical and electrical systems specified and as follows:
 - .1 Operate designated building component, mechanical/electrical equipment and system under all modes of operation and conduct checks and tests as directed by Commissioning Agent.
 - .2 Check and verify that building component, equipment, systems and integrated systems, including their controls, are functioning and responding correctly and interactively with each other.
 - .3 Test systems independently and then in unison with other related systems.
 - .4 Conduct all Commissioning checks and tests in presence of and witnessed by and Departmental Representative and Design Consultants.
 - .5 Assist Design Consultant and other members of the commissioning team who will also be present to commission Facility.

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- .3 Specific procedures used to commission Facility will be provided by Commissioning Agent which includes:
 - .1 Sequential order of building component and system to be tested.
 - .2 Running systems under various anticipated modes and demands (example: high and low cooling or heating loads, duplicating outside temperature conditions, fire alarm and power failure conditions etc.).
 - .3 Running building controls through all sequences of operation to verify and confirm that equipment and systems are responding as designed and intended.
 - .4 Operating designated equipment at peak capacities, recording output data against design criteria.
 - .4 Run component or systems as long as necessary to effectively commission all items as deemed required by Commissioning Agent and Departmental Representative.
 - .5 Monitor equipment and system responses.
 - .6 Record test results, measurements and other data on commissioning forms provided by Commissioning Agent.
 - .7 Assist in analyzing results. Identify system deficiencies and components not responding as intended.
 - .8 Correct deficiencies and system non-conformance issues. Adjust, calibrate or fine tune system components as required. Debug system software as may be required.
 - .9 Retest systems when directed to confirm compliance.
 - .4 Upon completion of Facility Commissioning:
 - .1 Provide training to maintenance & operational personnel as specified in clause 1.12 below.
 - .2 Turn over any filled-in checks sheets or reports resulting from commissioning.
 - .5 During Warranty period at Occupancy Stage:
 - .1 After 10 months has elapsed from the commencement of the warranty period, conduct commissioning checks on the building components and systems.
 - .2 Fine tune components, systems and integrated systems and continue system debugging to optimize Facility performance.

- .3 Rectify warranty issues.
- .4 Submit written report to Commissioning Agent and Departmental Representative.
 - .1 Indicate results noted and corrective action taken.
 - .2 Note improvements made to operating parameters and control settings.
 - .3 Recommend modifications deemed advisable to improve performance, environmental conditions, energy consumptions and other issues.
- .5 Commissioning Agent and other team members as determined by Departmental Representative to be present during such work.

1.9 COMMISSIONING
ACTIVITIES OF
OTHER TEAM MEMBERS

- .1 Commissioning Lead:
 - .1 Represents the Departmental Representative during the commissioning process.
 - .2 Coordinates activities of the commissioning team members to ensure that commissioning activities are carried out properly and in a timely manner.
 - .3 Prepares commissioning schedule in concert with Contractor.
 - .4 Chairs commissioning meetings.
 - .5 Works with Contractor, subcontractors, equipment suppliers, Design Consultant resources, PWGSC and Tenant Representatives to resolve technical problems which may arise during the process.
 - .6 Witnesses Contractor's pre-start, start-up and performance verification procedures for certain equipment and systems specified when deemed required due to their critical nature and function in the Facility.
 - .7 Verifies that Installation/Start-up Checklists and Performance Verification checks and tests are used and stringently followed by Contractor.
 - .8 Assists Contractor in coordination of training activities for facility staff.
 - .9 Submits final commissioning report to Departmental Representative.
- .2 Design Consultants:
 - .1 Prepares the Commissioning Plan.
 - .2 Reviews Contractor's Installation/Start-up Checklists for completeness, incorporating supplement data not addressed on checklist. Provides to Contractor checklist for products

which manufacturer does not provide installation and start-up instructions.

.3 Develops performance verifications report sheets for use by Contractor to record actual data and measurements against design data criteria.

.4 Includes, on performance verification report sheets, design data and anticipated performance values for equipment and systems to undergo verification.

.5 Compiles commissioning documentation submitted by Contractor. Prepares final Building Management Manuals.

.6 Assists in witnessing pre-start, start-up and performance verification activities.

.7 Approves type and method of calibration for instruments used by Contractor to conduct performance verification and commissioning tests.

.8 Assists in reviewing and analyzing tests results.

.9 Participate in the training sessions provided by Contractor to tenant O&M staff by giving introductory information on design philosophy, design intent and systems designs,

.10 Assist in the resolution of issues relating to commissioning.

.3 User Representative:

.1 Participates with other team members to ensure that systems as installed meet the operational and functional requirements.

.2 Periodically attends commissioning meetings as required.

.3 Attends final commissioning activities.

.4 Assists in resolving technical problems by providing additional details on operational requirements.

.4 Facility Operations and Maintenance Staff:

.1 Participates in the commissioning process to obtain early introduction to the facility systems and to provide early operator feedback.

.2 Prime interest is in the familiarization and training of appropriate maintenance staff.

.3 Staff may attend certain critical equipment start-up and performance verification activities and provide comments and practical suggestions on issues which may arise during actual operation, maintenance and repair of the equipment and systems.

.4 Attends commissioning meetings

periodically, depending on issues being discussed.

.5 Identifies the appropriate staff which must receive the O & M training.

1.10 COMMISSIONING
MEETINGS

- .1 General briefing on commissioning will be conducted at first project construction meeting at commencement of work.
 - .1 Issues discussed will include scope and extent of commissioning and clarify responsibilities of commissioning team members.
 - .2 All team members must attend, including subcontractors of equipment and systems to be commissioned.
- .2 Include commissioning as one agenda item at each construction meeting held and chaired by Contractor during construction. Give subject due consideration for each material and equipment supplied and for all matters of Work.
- .3 At the 60% construction completion stage, as determined by Departmental Representative, a separate commissioning scope meeting will be called by Departmental Representative to review progress of work, discuss schedule of equipment start-up activities and prepare for upcoming commissioning. Issues at meeting will include:
 - .1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems.
 - .2 Determine the degree of involvement of each trade and manufacturer's representatives in the commissioning process.
- .4 Separate commissioning meetings will be held from the 60% construction stage to project completion. Meetings are tentatively scheduled to be held on a bi-monthly basis but may be more frequent during the equipment start-up and functional testing period.
- .5 Whenever possible meetings will be held immediately following the construction meetings.
- .6 Meeting will be chaired by Departmental Representative, who will record and distribute minutes.
- .7 Ensure that all subcontractors and relevant manufacturer representatives are present at the

60% commissioning scope meeting and at other meetings as deemed required.

1.11 COMMISSIONING
SCHEDULE

- .1 Address commissioning activities within the construction work schedule. Clearly identify allocated time period for commissioning and training activities.
- .2 Provide a separate independent commissioning schedule at the 60% construction stage in order that specific issues and individual details of commissioning can be reviewed, discussed and dealt with from that period onward to project completion. Submit monthly updates thereafter,
- .3 Develop commissioning schedule in conjunction with Commissioning Agent. Indicate allocated time period and anticipated dates for:
 - .1 Submission of commissioning documentation, including O&M Manuals.
 - .2 Equipment and system start-up and performance verification, making them ready to be commissioned.
 - .3 Allocated period to commission designated building components and systems.
 - .4 Training period.
 - .5 Work during Warranty period.
- .4 Submit schedule to Departmental Representative for review.

1.12 TRAINING

- .1 Commence process of familiarizing users and O&M personnel in the early stages of work on purpose and operation of various equipment and systems. Continue process throughout the entire construction duration.
 - .1 Provide informal briefings during occasional site visits, at planned commissioning meetings and during the final commissioning site activities.
- .2 Conduct formal demonstration and training sessions' only after all identified systems have been commissioned by Commissioning Agent and Departmental Representative has given approval to proceed with the training process.
- .3 Provide training and demonstration on equipment, sub-systems, systems and integrated systems as

specified.

- .4 Carryout training in accordance with requirements of section 01 79 00.
- .5 Submit written agenda of training session(s) 4 weeks beforehand for review by Departmental Representative and Design Consultants.
- .6 Coordinate content with Commissioning Agent. Design Consultant will provide introductory presentation giving general outline of each system design and intended function.
- .7 Submit training manuals for review 2 weeks prior to actual training.
- .8 Ensure required tools and O&M Manuals are on site for training and system demonstration.
- .9 As a minimum, the training sessions to cover the following information:
 - .1 Introduction.
 - .2 Description of the system with factory personnel being involved at appropriate times.
 - .3 Instructions on start-up procedures including seasonal procedures, system check-lists and emergency procedures.
 - .4 Operational procedures, including occupancy considerations, seasonal change-over, manual and automatic operations and emergency modes.
 - .5 Instruction on system shutdowns, including checklists.
 - .6 Instructions on all aspects of system maintenance, including routine servicing, lubrication, overhaul and factory servicing.
 - .7 Information concerning the scope of warranties and their use.
 - .8 A description of spare parts in stock and their service.
 - .9 A description of normal tools required for servicing the systems/equipment.
- .10 Submit typewritten record of training sessions given and list of attendees. Use forms of format approved by Departmental Representative.

1.13 COMMISSIONING
DOCUMENTATION

- .1 Submit the following documentation for use during commissioning and for incorporation thereafter

into a Building Management Manual (BMM):

- .1 Operations and Maintenance Manuals, Project Record Documents and other data as specified in Section 01 78 00. Data to include:
 - .1 Equipment Product Information (PI Data) complete with:
 - .1 Nameplate info,
 - .2 Installation instructions,
 - .3 Operating procedures and
 - .4 Maintenance guidelines.
 - .2 Reviewed shop drawings,
 - .3 As-built record drawings and Specifications.
 - .2 Completed Installation/Start-up Checklist sheets used.
 - .3 Performance Verifications checks and tests procedures and completed report sheets used.
 - .4 Copy of any static and dynamic test and reports conducted.
 - .5 TAB report and other reports as specified in various trade sections.
- .2 Above documentation is required by Commissioning Agent to commission Facility. Submit data minimum 3 weeks before commencement of commissioning.
 - .3 Documentation to include detailed information and number of copies as specified for maintenance manuals of section 01 78 00.
 - .4 Commissioning Lead and Design Consultant will compile above documentation and produce a BMM manuals for operation/maintenance staff and tenant use.

PART 1 GENERAL

- 1.1 REFERENCES .1 Canadian Standards Association (CSA International)
- .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- 1.2 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
- .1 Provide shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Before proceeding with demolition of load bearing walls or of other walls and where required by authority having jurisdiction submit for review by Departmental Representative shoring and underpinning drawings prepared by qualified professional engineer registered or licensed in the Province of Newfoundland and Labrador in Canada showing proposed method.
- .4 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and indicate:
- .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
- .2 Schedule of selective demolition.
- .3 Number and location of dumpsters.
- .4 Anticipated frequency of tippage.
- .5 Name and address of haulers waste facilities waste receiving organizations.
- 1.3 DELIVERY, STORAGE AND HANDLING .1 Waste Management and Disposal:
- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.4 SITE
CONDITIONS

- .1 Review designated substance report (Appendix "A") and take precautions to protect environment.
- .2 Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous other than that noted in Appendix "A" be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.
 - .1 Do not proceed until written instructions have been received from Departmental Representative.
- .3 Notify Departmental Representative before disrupting building access or services.

PART 2 PRODUCTS

2.1 EQUIPMENT

- .1 Demonstrate that tools and machinery are being used in manner which allows for salvage of materials in best condition possible.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Do Work in accordance with Section 01 35 28 - Health and Safety Requirements.
- .2 Protection:
 - .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services and equipment.
 - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .3 Disconnect and re-route electrical, telephone and communication service lines. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of

demolition.

- .4 Locate and protect utility lines. Do not disrupt active or energized utilities traversing premises designated to remain undisturbed.
- .5 Disconnect and cap designated mechanical services.

3.2 DEMOLITION
SALVAGE AND
DISPOSAL

- .1 Remove parts of existing building to permit new construction. Sort materials into appropriate piles for recycling.
- .2 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.
- .3 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

3.3 PARTIAL
DEMOLITION OF
STRUCTURES

- .1 Refer to drawings.

3.4 STOCKPILING

- .1 Stockpile off site.

3.5 REMOVAL FROM
SITE

- .1 Transport material designated for alternate disposal by approved haulers and facilities listed in waste reduction workplan and in accordance with applicable regulations. Do not deviate from haulers and facilities receiving organizations listed in waste reduction workplan without prior written authorization from Departmental Representative.
- .2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations. Disposal facilities must be approved of and listed in waste reduction workplan. Do not deviate from disposal facilities listed in waste reduction workplan without prior written authorization from Departmental Representative.

PART 1 GENERAL

1.1 SUMMARY

- .1 Removal or partial removal or cutting or any interference with asbestos containing materials.
- .2 Complete removal of all partitions and wall and ceiling finishes and suspended systems to expose backup clay masonry wall and partition finishes backup and to expose structure above ceiling finish and suspended system. Consider these materials which are to be 100% demolished, to contain asbestos.
- .3 Complete removal of existing flooring, bases, setting beds and adhesives which shall be considered to contain asbestos.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-94, Sealer for Application of Asbestos Fibre Releasing Materials.
- .2 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .5 Underwriters' Laboratories of Canada (ULC)
- .6 Appendix "A" - Asbestos Management Plan

1.3 DEFINITIONS

- .1 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .2 Asbestos Containing Materials (ACMs): materials that contain 0.5 0.1 provincial regulated amount per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and

- settled dust.
- .3 Asbestos Work Area: area where work takes place which will, or may disturb ACMs.
 - .4 Authorized Visitors: designated representatives, and representatives of regulatory agencies.
 - .5 Competent worker person: in relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the federal laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
 - .6 Friable Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
 - .7 Glove Bag: prefabricated glove bag as follows:
 - .1 Minimum thickness 0.25 mm polyvinyl-chloride bag.
 - .2 Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.
 - .3 Equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag.
 - .4 Straps for sealing ends around pipe.
 - .8 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.
 - .9 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
 - .10 Occupied Area: any area of building or work site that is outside Asbestos Work Area.
 - .11 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along

edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

- .12 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

1.4 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos containing waste and proof that asbestos containing waste has been received and properly disposed.
- .6 Submit proof satisfactory to Departmental Representative that all asbestos workers have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative. Minimum of one supervisor for every ten workers.
- .8 Submit Worker's Compensation Board status and transcription of insurance.
- .9 Submit documentation including test results, fire and flammability data, and Material

Safety Data Sheets (MSDS) for chemicals or materials including:

- .1 Encapsulants;
 - .2 Amended water;
 - .3 Slow drying sealer.
- .10 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.
- .2 Health and Safety:
- .1 Do construction occupational health and safety in accordance with Section 01 35 28 - Health and Safety Requirements.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and

inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn.
- .3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

- .4 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are located as indicated on drawings.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.6 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site

bins for recycling in accordance with Waste Management Plan.

- .4 Separate for reuse recycling and place in designated containers steel metal plastic waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold up metal banding, flatten and place in designated area for recycling.
- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial/Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.
- .9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.7 EXISTING CONDITIONS

- .1 Reports and information pertaining to ACMS to be handled, removed, or otherwise disturbed and disposed of during this Project are bound into this specification.
- .2 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.8 SCHEDULING

- .1 Hours of Work: perform work involving asbestos outside of normal working hours. Include in Contract Sum additional costs due to this requirement.

1.9 PERSONNEL TRAINING

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every

worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, in use of glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.

- .2 Instruction and training related to respirators includes, at minimum:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Drop and Enclosure Sheets:
 - .1 Polyethylene: 0.25 mm thick.
 - .2 FR polyethylene: 0.25 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos containing material.
- .3 Waste Containers: contain waste in two separate containers.
 - .1 Inner container: 0.28 mm thick sealable polyethylene bag or where glove bag method is used, glove bag itself.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.
- .4 Glove bag:

- .1 Acceptable materials: safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.
- .2 The glove bag to be equipped with:
 - .1 Sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period.
 - .2 Valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure.
 - .3 A tool pouch with a drain.
 - .4 A seamless bottom and a means of sealing off the lower portion of the bag.
 - .5 A high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
- .5 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .6 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
 - .1 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.
- .7 Encapsulant: penetrating type conforming to CAN/CGSB-1.205 ULC listed.

PART 3 EXECUTION

- 3.1 SUPERVISION .1 Minimum of one Supervisor for every ten

workers is required.

- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.2 PROCEDURES

- .1 Do construction occupational health and safety in accordance with Section 01 35 28 - Health and Safety Requirements.
- .2 Before beginning Work, at each access to Asbestos Work Area, install warning signs in English language in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
 - .3 Before beginning Work remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.
 - .1 Use HEPA vacuum or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
 - .2 Do not use compressed air to clean up or remove dust from any surface.
 - .4 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.
 - .2 When removing suspended ceilings and walls themselves do not enclose work area and when removing asbestos containing material from piping or equipment and "glove bag" method is not used erect enclosure of polyethylene sheeting around work area, shut off mechanical ventilation system serving work area and seal ventilation ducts to and from work area.

- .5 Before removing asbestos containing materials, remove friable material on upper surfaces using HEPA vacuum equipment.
 - .1 Remove and clean surfaces of ceiling panels using HEPA vacuum, wrap clean panels in 0.10 mm thick polyethylene, and store in building as directed by Departmental Representative.
 - .2 Clean "T" grid suspension system, disconnect, wrap in 0.10 mm thick polyethylene, and store in building as directed by Departmental Representative.
- .6 Remove loose material by HEPA vacuum; thoroughly wet friable material containing asbestos to be removed or disturbed before and during Work unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.
 - .2 Perform Work in a manner to reduce dust creation to lowest levels practicable.
- .7 Pipe Insulation Removal Using Glove Bag:
 - .1 A glove bag not to be used to remove insulation from a pipe, duct or similar structure if:
 - .1 It may not be possible to maintain a proper seal for any reason including, without limitation:
 - .1 The condition of the insulation.
 - .2 The temperature of the pipe, duct or similar structure.
 - .2 The bag could become damaged for any reason including, without limitation.
 - .1 The type of jacketing.
 - .2 The temperature of the pipe, duct or similar structure.
 - .2 Upon installation of the glove bag, inspect bag for any damage or defects. If any damage or defects are found, the glove bag is to be repaired or replaced. The glove bag to be inspected at regular

intervals for damage and defects, and repair or replaced, as appropriately. The asbestos containing contents of the damaged or defective glove bag found during removal are to be wetted and the glove bag and its contents are to be removed and disposed of in an appropriate waste disposal container. Any damaged or defective glove bags are not be reused.

- .3 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.
- .4 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.
- .5 Insert nozzle of garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.
- .6 To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into waste container and seal.
- .7 After removal of bag ensure that pipe is free of residue. Remove residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.
- .8 Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.
- .8 Work is subject to visual inspection and air

monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

.9 Cleanup:

- .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
- .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
- .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
- .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
- .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.3 AIR
MONITORING

- .1 From beginning of Work until completion of cleaning operations, arrange and pay for the services of a licenced testing firm, take air samples on a daily basis outside of Asbestos Work Area enclosures in accordance with Provincial/Territorial Occupational Health and Safety Regulations.
 - .1 Contractor will be responsible for arrangement of and payout for testing firm monitoring inside and outside the enclosure in accordance with applicable Provincial/Territorial Occupational Health and Safety Regulations.

- .2 If air monitoring shows that areas outside Asbestos Work Area enclosures are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Area.
- .3 Ensure that respiratory safety factors are not exceeded.
- .4 During the course of Work, Departmental Representative to measure fibre content of air outside Work areas by means of air samples analyzed by Phase Contrast Microscopy (PCM).
 - .1 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.

PART 1 GENERAL

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A269-08, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-09, Design of Steel Structures.
 - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) Metric.
- .3 Environmental Choice Program
 - .1 CCD-047-98(R2005), Architectural Surface Coatings.
 - .2 CCD-048-98(R2006), Surface Coatings - Recycled Water-borne.
- .4 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.

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- 1.2 ACTION AND INFORMATIONAL SUBMITTALS
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- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for sections plates pipe tubing bolts and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 28 - Health and Safety Requirements 01 35 43 - Environmental Procedures.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
 - .3 Shop Drawings:
 - .1 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
- 1.3 QUALITY ASSURANCE
-
- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
 - .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- 1.4 DELIVERY, STORAGE AND HANDLING
-
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
 - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

- .4 Develop Construction Waste Management Plan
Waste Reduction Workplan related to Work of
this Section.
- .5 Packaging Waste Management: remove for reuse
and return by manufacturer of pallets,
crates, padding, and packaging materials as
specified in Construction Waste Management
Plan Waste Reduction Workplan in accordance
with Section 01 74 21 -
Construction/Demolition Waste Management and
Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CSA
G40.20/G40.21, Grade 350W.
- .2 Steel pipe: to ASTM A53/A53M standard weight.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Aluminum sheet: proprietary utility sheet
plain, 1.0 mm minimum thickness, finish,
colour clear.
- .7 Grout: non-shrink, non-metallic, flowable, 15
MPa at 24 hours.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and
accurate to required size, with joints
closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed
screws on items requiring assembly by screws
or as indicated.
- .3 Where possible, fit and shop assemble work,
ready for erection.
- .4 Ensure exposed welds are continuous for
length of each joint. File or grind exposed
welds smooth and flush.

2.3 FINISHES

- .1 Shop coat primer: MPI-INT EXT 5.1A MPI-INT
EXT 5.1B in accordance with chemical
component limits and restrictions

requirements and VOC limits of CCD-047a CCD-048 GS-11.

- .2 Zinc primer: zinc rich, ready mix to MPI-INT EXT 5.2C in accordance with chemical component limits and restrictions requirements and VOC limits of CCD-047a CCD-048 GS-11.

2.4 ISOLATION
COATING

- .1 Isolate aluminum from following components, by means of bituminous paint:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.5 SHOP
PAINTING

- .1 Primer: VOC limit 250 g/L maximum to GS-11 CCD-047a CCD-048.
- .2 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .3 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .4 Clean surfaces to be field welded; do not paint.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

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- 3.2 ERECTION
- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
 - .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
 - .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
 - .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
 - .5 Supply components for work by other trades in accordance with shop drawings and schedule.
 - .6 Make field connections with bolts to CSA S16 or Weld field connection.
 - .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
 - .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.
 - .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.
- 3.3 CLEANING
- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

PART 1 GENERAL

1.1 RELATED SECTIONS .1 Division 26 - Electrical: Outlets and Wiring.

1.2 SHOP DRAWINGS .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate details of construction, profiles, jointing, fastening and other related details.
.3 Indicate all materials, thicknesses, finishes and hardware.
.4 Indicate locations of all service outlets in casework, typical and special installation conditions, and all connections, attachments, anchorage and location of exposed fastenings.

1.3 QUALITY ASSURANCE .1 Fabricate a mock-up that will demonstrate the various aspects of the cabinetry specified.
.2 Mock-up to be approved prior to fabrication of all millwork.
.3 The approved mock may remain on site as part of the millwork and it will form the standard of acceptance for the remainder of the millwork.

1.4 FABRICATION .1 Fabricate finish carpentry to Quality Standards SEFA-8.

1.5 DELIVERY, STORAGE, AND HANDLING .1 Protect millwork against dampness and damage during and after delivery.
.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

1.6 WASTE MANAGEMENT AND DISPOSAL .1 Collect and separate for disposal waste material in appropriate on site bins in accordance with Waste Management Plan.

1.7 SUMMARY AND SCOPE

.1 Section Includes:

- .1 Furnish all cabinets and casework, including tops, ledges, supporting structures. Include delivery to the building, Furnish and deliver all utility service outlet accessory fittings, electrical receptacles and switches identified on drawings as mounted on the laboratory furniture. All plumbing and electrical fittings, not preinstalled in equipment, will be packaged separately and properly marked for delivery to the appropriate contractor.
- .2 Furnish and deliver, for installation by the mechanical contractor, all Laboratory sinks, cup sinks or drains, drain troughs, overflows and sink outlets with integral tailpieces, which occur above the floor, and where these items are part of the equipment. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system.

1.8 BASIS OF WORK

- .1 Supply all equipment in accordance with this specification. The offering of a product differing in materials and construction from this specification requires written approval from the owner/architect. This approval must be obtained seven (7) days before the quotation deadline. Procedures for obtaining approval for an alternate manufacturer are defined in this specification.
- .2 General Contractors should secure a list of approved laboratory furniture manufacturers from the architect as a protection against non-conformance to these specifications.
- .3 Participants in the quotation process have the option of clarifying deviations to the specified design, construction, or materials. Without such clarifications, sealed quotations to the owner or owner representative will be construed as being in total conformance to the requirements of the specification.
- .4 The owner / owner representative reserves the right to reject qualified or alternate proposals and to award based on product value where such action assures the owner greater

integrity of product.

1.9 QUALITY OF ASSURANCE .1 The steel laboratory furniture contractor shall also provide worktops all manufactured or shipped from the same geographic location to assure proper staging, shipment and single source responsibility.

.2 General Performance: Provide certification that furniture shall meet the performance requirements described in SEFA 8.

1.10 SUBMITTALS .1 Manufacturer's Data: Submit manufacturer's data and installation instructions for each type of casework. Provide data indicating compliance with SEFA 8.

.2 Shop Drawings:

.1 Submit shop drawings for furniture assemblies showing plans, elevations, ends, cross-sections, service run spaces, location and type of service fittings.

.1 Coordinate shop drawings with other work involved.

.2 Provide roughing-in drawings for mechanical and electrical services when required.

PART 2 PRODUCTS

2.1 MANUFACTURERS .1 All laboratory equipment covered by the specification shall be the product of one manufacturer and be fabricated at one geographic location to assure shipping continuity and single-source responsibility. All quotations from a manufacturer shall contain a review of the following capabilities:

.1 List of shop facilities

.2 List of engineering and manufacturing personnel

.3 Proof of financial ability to fulfill the contract

.4 List of a minimum of ten (10) installations over the last five (5) years of comparable scope

.5 Proof of project management and installation capabilities

.6 SEFA member in Good Standing

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- .2 The selected manufacturer must warrant for a period of one-year starting (date of acceptance or occupancy, whichever comes first) that all products sold under the contract referenced above shall be free from defects in material and workmanship. Purchaser shall notify the manufacturer's representative immediately of any defective product. The manufacturer shall have a reasonable opportunity to inspect the goods. The purchaser shall return no product until receipt by purchaser of written shipping instructions from the manufacturer.
- .3 The architect will retain the above samples of the successful manufacturer or owner to insure that material delivered to jobsite conforms in every respect to the samples submitted.
- 2.2 CABINET STYLE
- .1 Steel:
- .1 Cabinet bodies, drawer bodies, shelves, drawer heads and door assemblies shall be fabricated from Cold Rolled Steel. (Note: All Drawer and Door Styles are available)
- .2 Standard of Acceptance: Air Master Systems Inc. Metal laboratory casework services and "solutions" services based also on part/component numbers as indicated on the drawings.
- 2.3 DRAWER AND DOOR STYLE
- .1 The outer drawer and door head shall have a channel formation on all four sides to eliminate sharp raw edges of steel and shall be welded and ground smooth. Drawer and door, when closed, shall be recessed to create an overall flush face. Drawer and door pulls shall be an integral contour radiused pull along the top edge.
- 2.4 MATERIALS
- .1 General Requirements:
- .1 It is the intent of this specification to provide a high quality steel cabinet specifically designed for the laboratory environment.
- .2 Steel:
- .1 Cold Rolled Steel:
- .1 Cold rolled sheet steel shall be prime grade 12, 14, 16, 18 and 20 gauge U.S. Standard; roller

leveled, and shall be treated at the mill to be free of scale, ragged edges, deep scratches or other injurious effects.

.3 Glass:

- .1 Glass used for framed sliding and swinging doors shall be 1/8" float glass. Glass used for unframed sliding doors, shall be 1/4" float glass. Glass used in fume hoods or other hazardous locations shall be 7/32" laminated safety float glass, except the glass shielding fluorescent lights in fume hoods shall be tempered glass to provide greater resistance to heat and impact.

.4 Hardware and Trim:

.1 Drawer and Door Pulls:

- .1 Contour - 5 - Pull shall be of modern design, offering a comfortable continuous handgrip. Pull shall be integrally formed at top of drawer and door, and grooved in back of drawer head to interlock with drawer body. Use of Aluminum, Steel, or plastic pulls (molded or extruded), or a design not compatible for usage by the handicapped will not be acceptable.

.2 Hinges:

- .1 Hinges shall be made of Type 304 stainless steel .089 thick, 2-1/2" high, with brushed satin finish, and shall be the institutional type with a five knuckle bullet type barrel. Hinges shall be attached to both door and case with two screws through each leaf. Welding of hinges to door or case will not be accepted. Doors under 36" in height shall be hung on one pair of hinges, and doors over 36" high shall be hung on 3 hinges.

.3 Locks:

.1 Disk Tumbler:

- .1 Locks when shown or called for shall be a 5-disc tumbler with heavy duty interchangeable cylinder. Exposed lock noses shall be dull nickel (satin) plated

and stamped with identifying numbers. Locks shall have capacity for 2000 primary key changes. Master key one level with the potential of 10 different, non-interchangeable master key groups.

OR

.2 Pin Tumbler:

- .1 Locks when shown or called for shall be a pin tumbler with heavy duty interchangeable cylinder. Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers. Locks shall have capacity of at least 1000 primary key changes, and the capacity to be Masterkeyed, Grand-masterkeyed, Sub-masterkeyed, and Mason Keyed.

.4 Positive Catch:

- .1 A two-piece heavy-duty cam action positive catch shall be provided on all base cupboard doors and shall be positioned near the pivoting edge of door to provide a clean unobstructed opening. Main body of the catch shall be confined within an integral cabinet divider rail, while latching post shall be mounted on the hinge side of door. Nylon roller type catches are not acceptable.

.5 Elbow Catches:

- .1 Elbow catches and strike plates shall be used on left hand doors of double door cases where locks are used, and are to be burnished cast aluminum, with bright brass finish.

.6 Shelf Adjustment Clips:

- .1 Shelf adjustment clips shall be nickel-plated steel.

.7 Base Molding:

- .1 Base molding shall be provided

.8 Sink Supports:

- .1 Sink supports shall be the hanger type, suspended from top front and top rear horizontal rails of sink cabinet by four 1/4" dia. rods, threaded at bottom end and offset at top to hang from two full length reinforcements welded to the front and rear top rails. Two 3/4" x 1 2/2" x 12 gauge channels shall be hung on the threaded rods to provide an adjustable sink cradle for supporting sinks. When sink capacity exceeds 3,750 cu. in., the sink supports shall be suspended from full-length reinforcements welded to the two end rails. Two 1" x 2" x 10 gauge full-length channels shall be hung from the four 1/4" dia. rods to provide an alternate sink cradle.

2.5 CONSTRUCTION .1 Steel Base Cabinet Construction:

- .1 General:
 - .1 The steel furniture shall be of modern design and shall be constructed in accordance with the best practices of the Scientific Laboratory Equipment Industry. First class quality casework shall be insured by the use of proper machinery, tools, dies, fixtures and skilled workmanship to meet the intended quality and quantity for the project.
 - .2 All cabinet bodies shall be flush front construction with intersection of vertical and horizontal case members, such as end panels, top rails, bottoms and vertical posts in same plane without overlap. Exterior corners shall be spot welded with heavy back up reinforcement at exterior corners. All face joints shall be welded and ground smooth to provide a continuous flat plane.
 - .3 Each cabinet shall be complete so that units can be relocated at any subsequent time without requiring field application of finished ends or other such parts.
 - .4 Case openings shall be rabbetted

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- on all four sides for both hinged and sliding doors to provide a dust resistant case.
- .5 All cabinets shall have a cleanable smooth interior. Bottom edges shall be formed down on sides and back to create easily cleanable corners with no burrs or sharp edges, and front edge shall be offset to create a seamless drawer and door recess rabbet for dust stop.
- .2 Steel Gauges:
- .1 Gauges of steel used in construction of cases shall be 18 gauge, except as follows:
- .1 Corner gussets for leveling bolts and apron corner braces, 12 gauge.
- .2 Case and drawer suspension channels, 14 gauge.
- .3 Top and intermediate front horizontal rails, table aprons, hinge reinforcements, and reinforcement gussets, 16 gauge.
- .4 Drawer assemblies, door assemblies, bottom, bottom back rail, toe space rail, and adjustable shelves, 20 gauge.
- .3 Base Cabinets:
- .1 End uprights shall be formed into not less than a channel formation at top, bottom, back and front. The front edge shall further offset to form a strike for doors and drawers, and shall be perforated for the support of drawer channels, intermediate rails and hinge screws. An upright filler shall be screwed in place in all cupboard units to close the back of the channel at front of the upright and to provide a smooth interior for the cupboard to facilitate cleaning. The upright filler shall be perforated with shelf adjustment holes at not more than 2" centers painted prior to assembly. The inside front of the upright shall be further reinforced with a full height 16 gauge hinge reinforcement angle.
- .2 Top horizontal rail on base cabinets shall interlock within the flange at top of end panels for strength, but shall be

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- flush as face of unit. Top rail shall have a full width rabbet for swinging doors and drawers. Reinforcements shall be provided at all front corners for additional welded strength between vertical and horizontal case members.
- .3 Intermediate rails shall be provided between doors and drawers, but shall not be provided between drawers unless made necessary by locks in drawers. When required, intermediate rails shall be recessed behind doors and drawer fronts, and designed so that security panels may be added as required.
- .4 Intermediate vertical uprights shall be furnished to enclose cupboards when used in a unit in combination with a half width bank of drawers. However, to allow storage of large or bulky objects, no upright of any type shall be used at the center of double door cupboard units.
- .5 Cabinet bottom, and bottom rail shall be formed of one piece of steel except in corner units and shall be formed down on sides and back to create a square edge transition welded to cabinet end panels, and front edge shall be offset to create a seamless drawer and door recess rabbet for dust stop.
- .6 Toe space rail shall extend up and forward to engage bottom rail to form a smooth surfaced fully enclosed toe space, 3" deep x 5" high. Whenever toe space base is omitted for units to set on building bases on separate steel bases, then the toe space rail shall extend back 4 1/2".
- .7 Back construction shall consist of a top and bottom rail, channel formed for maximum strength and welded to back and top flange of end uprights, open for access to plumbing lines. Cupboard units only shall be provided with removable back panels.
- .8 Die formed gussets, with multiple ends for strength, shall be furnished in each bottom corner of base units to insure rigidity, and a 3/8" 16 leveling bolt, 3" long, shall engage a clinch nut in each gusset. Access to the leveling bolts shall be through plug buttons in the bottom pan. Each leveling bolt and gusset shall be capable of supporting

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- 500 lbs. Access to leveling bolts through toe space or leveling bolts requiring special tools to adjust are not acceptable.
- .9 Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear; formed down 3/4" at each end, shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf.
- .10 Drawer bodies shall be made in one piece construction including the bottom, two sides, back and front. They shall be fully coved at interior bottom on all four sides for easy cleaning. The top front of the inner drawer body shall be offset to interlock with the channel formation in drawer head providing a 3/4" thick drawer head.
- .11 Drawer suspension assembly shall consist of 2 sections providing a quiet, smooth operation on ball bearing nylon rollers. All drawers shall be self closing from a point 5" open. Cabinet channels shall maintain alignment of drawer and provide an integral drawer stop, but the drawer shall be removable without the use of tools. Drawers shall provide 13 5/8" front to back clearance when fully extended. Drawers shall rise when opened thus avoiding friction with lower drawers and/or doors. Drawer suspension system shall incorporate a double stop, lock open feature. Case suspension channels shall be Galvanized Steel, drawer suspension channels shall be Cold Rolled Steel. Drawer suspension channels on Stainless Steel Cabinets shall be zinc plated after they are formed.
- .12 Steel Door assembly (two piece) for solid pan swinging doors shall consist of an inner and outer door pan. Outer door pan shall be formed at all four sides. The corners on the pull side of the outer door pan shall be welded and ground smooth to prevent exposure of sharp edges of steel at these critical points. Inner door pan shall be flanged at all four sides with hinge reinforcements welded in place. The door assembly shall be 3/4" thick and contains sound deadening material.
- .13 Steel Drawer/door assemblies shall be

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- painted prior to assembly. Both shall be punched for attaching drawer pulls. Likewise, inner pan formation of door and drawer body shall be indented for in field installation of locks when required.
- .14 Doors shall be readily removable and hinges easily replaceable. Hinges shall be applied to the cabinet and door with screws. Welding of hinges to either cabinet or door will not be acceptable.
 - .15 Knee space panels, where shown or specified, shall be 20 gauge, finished same as casework cabinets, and easily removable for access to mechanical service areas.
- .4 Steel Sliding Door Upper Cabinet Construction:
- .1 Sliding door storage cabinets shall have a completely finished interior same as exterior. Doors shall be suspended from the top by nylon rollers in a roll formed steel track welded to top of cabinet. Track shall be so designed to prevent accidental removal of doors in operation position.
 - .2 End uprights shall be formed at front, bottom and back to provide maximum strength and rigidity. Front fascia of upright shall be 1" wide with inside edge formed in channel 2" x 1/4". A full height box reinforcement shall be fitted to the channel, formed to provide a recessed strike for door and to reinforce the case. The backside of the reinforcement shall be perforated with shelf adjustment holes spaced at not more than 1" centers. The back of upright shall be formed to a 2-1/2" formation. A 16-gauge hinge reinforcement same as specified for base units shall be welded to inner side of front uprights.
 - .3 Cabinet tops shall be formed with a 1-1/2" wide front fascia, and a 2" x 2" channel formation at front edge flanged down and back. Door suspension roll formed steel track shall be welded to cabinet top.
 - .4 Cabinet flush bottoms shall be formed with a 1" wide front fascia, and a channel formation at front edge flanged

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- back and up to create a door recess
rabbet for dust stop.
- .5 Cabinet backs shall be welded to the top, bottom and ends. Backs shall be perforated for shelf adjustment holes on not more than 1" centers. Holes shall be set in a channel formation in cabinet back and enclosed by end uprights.
- .6 Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear, formed down 3/4" at each end, shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf.
- .7 Glazed sliding doors shall be suspended from the top in a roll formed steel track welded to cabinet top and shall glide on nylon rollers. Track shall be so designed to prevent accidental removal of doors. Doors shall be 3/4" thick and consist of an inner and outer door pan welded together to form a single unit. Outer door pan shall be 18 gauge steel, formed into a channel or flanged shape at all four sides. It shall be pierced and formed to create a 3" wide frame with a beveled edge around the glass opening in the center of the door. Inner door pan shall be 18 gauge steel, flanged at all four sides, and pierced for a glass opening in center of the door. Doors shall be glazed with 1/8" float glass, held in place by a rubber or vinyl gasket around the entire edge of the glass. Outer door pan shall be pierced for a recessed flush pull, as described under HARDWARE.
- .8 Solid panel sliding doors shall be suspended same as glazed sliding doors. Door assembly (two-piece) shall consist of inner and outer pan formations, mechanically assembled after painting. All doors shall be 3/4" thick and contains sound deadening material.
- .9 Sliding plate glass doors shall be available for 48" high cases and under. The plate glass doors shall operate on an extruded aluminum track at the bottom of the cabinet, and in an extruded aluminum channel at the top. The bottom of each glass door shall be furnished with a continuous aluminum shoe the full length of the door, which shall be

equipped with two nylon rollers that operate on the extruded aluminum track. The aluminum shoes on the bottom of the plate glass doors shall be equipped with pulls for operation of the doors, and also to prevent bypassing of the doors. Plate glass doors shall close against rubber bumpers.

.5 Steel Swinging Door Construction:

- .1 Swinging door storage cabinets shall have a completely finished interior same as exterior.
- .2 End uprights shall be formed at the front in a 1" channel formation with the inside flange formed to provide a 31/32" x 1/2" door recess. The back of the upright shall be formed to a 2-1/2" formation. A 16 gauge hinge reinforcement, same as specified for BASE CABINETS, shall be welded to inner side of front uprights.
- .3 Cabinet tops shall be formed into a 1" x 1-3/16" channel shape at front, with a 31/32" x 1/2" offset for door recess, and with flange at rear and sides for electro-welding cabinet top to cabinet back and ends.
- .4 Cabinet flush bottoms shall be formed with a 1" wide front fascia and a 13/16" channel shape formation at front edge flanged back and up to create a door recess rabbet for dust stop.
- .5 Cabinet backs shall be welded to the top, bottom and ends. Backs shall be perforated for shelf adjustment holes on not more than 1" centers. Holes shall be set in a channel formation in cabinet back and enclosed by end uprights.
- .6 Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear, formed down 3/4" at each end, shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf.
- .7 Glazed swinging doors shall be 3/4" thick and consist of an inner and outer door pan welded to form a single unit. Outer door pan shall be 18 gauge steel, formed into a channel or flanged shape at all four sides. It shall be pierced and formed to create a 3" wide frame

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- with a beveled edge around the glass opening in the center of the door. Inner door pan shall be 18 gauge steel, flanged at all four sides, pierced for a glass opening in center of the door, with 16 gauge hinge reinforcements welded in place. Doors shall be glazed with 1/8" float glass, held in place by a rubber or vinyl gasket around the entire edge of the glass. Outer door pan shall be pierced for a recessed flush pull, as described under HARDWARE.
- .8 Door assembly (two piece) for solid panel swinging doors shall consist of an inner and outer door pan. Outer door pan shall be formed into a channel or flanged shape at all four sides. The corners on the pull side of the outer door pan shall be welded and ground smooth to prevent exposure of sharp edges of steel at these critical points. Inner door pan shall be flanged at all four sides with hinge reinforcements welded in place. The door assembly shall be 3/4" thick and contains sound deadening material.
- .6 Steel Swinging Door Full Height Cabinet Construction:
- .1 Swinging door full height storage cabinets shall have a completely finished interior same as exterior.
- .2 End uprights shall be formed at the front in a 1" channel formation with the inside flange formed to provide a 31/32" x 1/2" door recess. The back of the upright shall be formed to a 2-1/2" formation. A 16 gauge hinge reinforcement, same as specified for BASE CABINETS, shall be welded to inner side of front uprights.
- .3 Cabinet tops shall be formed into a 1" x 1-3/16" channel shape at front, with a 31/32" x 1/2" offset for door recess, and with flange at rear and sides for electro-welding cabinet top to cabinet back and ends.
- .4 Cabinet bottoms for storage cabinets shall be formed down on sides and back to create a square edge transition welded to cabinet end panels, and front edge shall be offset to create a seamless drawer and door recess rabbet for dust stop. Cabinet bottoms shall be

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- formed to provide a flush 1" face rail with a return flange to give a 9/16" deep x 5" high toe space.
- .5 Cabinet backs shall be welded to the top, bottom and ends. Backs shall be perforated for shelf adjustment holes on not more than 1" centers. Holes shall be set in a channel formation in cabinet back and enclosed by end uprights.
- .6 Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear, formed down 3/4" at each end, shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf.
- .7 Toe space rails shall interlock in back of bottom rail and with end panel to provide a welding plate, and shall extend to the floor with a flange turned back 1 1/2" and turned up 3/8" for support.
- .8 Glazed swinging doors shall be 3/4" thick and consist of an inner and outer door pan welded to form a single unit. Outer door pan shall be 18 gauge steel, formed into a channel or flanged shape at all four sides. It shall be pierced and formed to create a 3" wide frame with a beveled edge around the glass opening in the center of the door. Inner door pan shall be 18 gauge steel, flanged at all four sides, pierced for a glass opening in center of the door, with a 16 gauge hinge reinforcements welded in place. Doors shall be glazed with 1/8" float glass, held in place by a rubber or vinyl gasket around the entire edge of the glass. Outer door pan shall be pierced for a recessed flush pull, as described under HARDWARE.
- .9 Solid panel swinging doors (two piece) shall consist of an inner and outer pan formation, mechanically assembled after painting. All exterior surfaces shall be welded and ground smooth. Inner door pan shall be flanged for mechanical assembly. Door shall have a 14 gauge hinge reinforcement welded at hinge slot; as well as a full height channel formation welded to inner pan. Doors shall be 3/4" thick and contains sound deadening material.

2.6 PERFORMANCE REQUIREMENTS

- .1 Steel Casework Construction Performance:
- .1 Base cabinets shall be constructed to support at least a uniformly distributed load 200 lbs. per square foot of cabinet top area, including working surface without objectionable distortion of interference with door and drawer operation.
 - .2 Base cabinet corner gussets with leveling bolts shall support 500 lbs. per corner, at 1 1/2" projection of the leveling bolt below the gusset.
 - .3 Each adjustable and fixed shelf 4 ft. or shorter in length shall support an evenly distributed load of 40 lbs. per square ft. up to a maximum of 200 lbs., with nominal temporary deflection, but without permanent set.
 - .4 Drawer construction and performance shall allow 13-5/8" clear when in an extended position and suspension system shall prevent friction contact with any other drawer or door during opening or closing. All drawers shall operate smoothly, a minimum of 10,000 cycles with an evenly distributed load of 150 lbs.
 - .5 Swinging doors on floor-mounted casework shall support 200 lbs. suspended at a point 12" from hinged side, with door swung through an arc of 160 degrees. Weight load test shall allow only a temporary deflection, without permanent distortion or twist. Door shall operate freely after test and assume a flat plane in a closed position.
- .2 Steel Paint System Finish and Performance Specification:
- .1 Steel Paint System Finish:
 - .1 After Cold Rolled Steel and Textured Steel component parts have been completely welded together and before finishing, they shall be given a pre paint treatment to provide excellent adhesion of the finish system to the steel and to aid in the prevention of corrosion. Physical and chemical cleaning of the steel shall be accomplished by washing with an alkaline cleaner, followed

by a spray treatment with a complex metallic phosphate solution to provide a uniform fine grained crystalline phosphate surface that shall provide both an excellent bond for the finish and enhance the protection provided by the finish against humidity and corrosive chemicals.

After the phosphate treatment, the steel shall be dried and all steel surfaces shall be coated with a chemical and corrosion resistant, environmentally friendly, electrostatically applied powder coat finish. All components shall be individually painted, insuring that no area be vulnerable to corrosion due to lack of paint coverage. The coating shall then be cured by baking at elevated temperatures to provide maximum properties of corrosion and wear resistance.

The completed finish system in standard colors shall meet the performance test requirements specified under PERFORMANCE TEST RESULTS.

.2 Colours to be selected by Departmental Representative from manufacturers complete colour range. Product shall be available in a minimum of eight (8) colours.

.2 Performance Test Results (Chemical Spot Tests):

.1 Testing Procedure:

.1 Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 1-1/4" dia. watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 2 ounce wide mouth bottle to retard evaporation. All spot tests shall be

conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of $77^{\circ} \pm 3^{\circ}$ F. For both methods, leave the reagents on the panel for a period of one hour. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Immediately prior to evaluation, 16 to 24 hours after the reagents are removed, the test surface shall be scrubbed with a damp paper towel and dried with paper towels.

.2 Test Evaluation:

Evaluation shall be based on the following rating system.

Level 0 - No detectable change

Level 1 - Slight change in color or gloss.

Level 2 - Slight surface etching or severe staining.

Level 3 - Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

After testing, panel shall show no more than three (3) Level 3 conditions.

.3 Test Reagents

Test No.	Chemical Reagent	Test Method
1.	Acetate, Amyl	Cotton ball & bottle
2.	Acetate, Ethyl	Cotton ball & bottle
3.	Acetic Acid, 98%	Watch glass

4.	Acetone	Cotton ball & bottle
5.	Acid Dichromate, 5%	Watch glass
6.	Alcohol, Butyl	Cotton ball & bottle
7.	Alcohol, Ethyl	Cotton ball & bottle
8.	Alcohol, Methyl	Cotton ball & bottle
9.	Ammonium Hydroxide, 28%	Watch glass
10.	Benzene	Cotton ball & bottle
11.	Carbon Tetrachloride	Cotton ball & bottle
12.	Chloroform	Cotton ball & bottle
13.	Chromic Acid, 60%	Watch glass
14.	Cresol	Cotton ball & bottle
15.	Dichlor Acetic Acid	Cotton ball & bottle
16.	Dimethylformamide	Cotton ball & bottle
17.	Dioxane	Cotton ball & bottle
18.	Ethyl Ether	Cotton ball & bottle
19.	Formaldehyde, 37%	Cotton ball & bottle
20.	Formic Acid, 90%	Watch glass
21.	Furfural	Cotton ball & bottle
22.	Gasoline	Cotton ball & bottle
23.	Hydrochloric Acid, 37%	Watch glass
24.	Hydrofluoric Acid, 48%	Watch glass
25.	Hydrogen Peroxide, 3%	Watch glass
26.	Iodine, Tincture of	Watch glass
27.	Methyl Ethyl Ketone	Cotton ball & bottle
28.	Methylene Chloride	Cotton ball & bottle
29.	Mono Chlorobenzene	Cotton ball & bottle
30.	Naphthalene	Cotton ball & bottle
31.	Nitric Acid, 20%	Watch glass
32.	Nitric Acid, 30%	Watch glass
33.	Nitric Acid, 70%	Watch glass
34.	Phenol, 90%	Cotton ball & bottle

35.	Phosphoric Acid, 85%	Watch glass
36.	Silver Nitrate, Saturated	Watch glass
37.	Sodium Hydroxide, 10%	Watch glass
38.	Sodium Hydroxide, 20%	Watch glass
39.	Sodium Hydroxide, 40%	Watch glass
40.	Sodium Hydroxide, Flake	Watch glass
41.	Sodium Sulfide, Saturated	Watch glass
42.	Sulfuric Acid, 33%	Watch glass
43.	Sulfuric Acid, 77%	Watch glass
44.	Sulfuric Acid, 96%	Watch glass
45.	Sulfuric Acid, 77% and Nitric Acid, 70%, equal parts	Watch glass
46.	Toluene	Cotton ball & bottle
47.	Trichloroethylene	Cotton ball & bottle
48.	Xylene	Cotton ball & bottle
49.	Zinc Chloride, Saturated	Watch glass

* Where concentrations are indicated, percentages are by weight.

.3 Performance Test Results (Heat Resistance):

- .1 Hot water (190° F - 205° F) shall be allowed to trickle (with a steady stream at a rate not less than 6 ounces per minute) on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.

.4 Performance Test Results (Impact Resistance):

- .1 A one-pound ball (approximately 2" diameter) shall be dropped from a distance of 12 inches onto the finished surface of steel panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close eye- ball examination.

.5 Performance Test Results (Bending Test):

- .1 An 18 gauge steel strip, finished as specified, when bent 180o over a 1/2" diameter mandrel, shall show no peeling or flaking off of the finish.

.6 Performance Test Results (Adhesion):

- .1 Ninety or more squares of the test sample shall remain coated after the scratch adhesion test. Two sets of eleven parallel lines 1/16" apart shall be cut with a razor blade to intersect at right angle thus forming a grid of 100 squares. The cuts shall be made just deep enough to go through the coating, but not into the substrate. They shall then be brushed lightly with a soft brush. Examine under 100 foot-candles of illumination. Note: This test is based on ASTM D2197 68, "Standard Method of Test for Adhesion of Organic Coatings".

.7 Performance Test Results (Hardness):

- .1 The test sample shall have a hardness of 4 H using the pencil hardness test. Pencils, regardless of their brand are valued in this way: 8 H is the hardest, and next in order of diminishing hardness are 7 H, 6 H, 5 H, 4 H, 3 H, 2 H, F, HB, B (soft), 2 B, 3 B, 4 B, 5 B (which is the softest).
- .2 The pencils shall be sharpened on emery paper to a wide sharp edge. Pencils of increasing hardness shall be pushed across the paint film in a chisel like manner until one is found that will cut or scratch the film. The pencil used before that one that is, the hardest pencil that will not rupture the film is then used to express or designate the hardness.

2.7 WORK SURFACES

.1 Materials:

- .1 Epoxy Resin Tops 1" Thick, Satin non shiny surface.

2.8 SINKS

.1 Molded Epoxy Resin flush Sinks.

2.9 FITTINGS

.1 Materials: (Choose one or more and import

information from SERVICE FITTINGS AND ACCESSORIES spec.)

- .1 Chrome-plated red brass or bronze
- .2 Coated red brass or sepia bronze
- .2 Construction: (Choose one or more and import information from SERVICE FITTINGS AND ACCESSORIES spec.)
 - .1 Valves:
 - .1 Front-loaded valves
 - .2 Water
 - .3 Steam
 - .4 Distilled Water
 - .5 Ground key dry service
 - .6 Needle valve dry service

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Do architectural woodwork to Quality Standards of the SEFA-8, except where specified otherwise.
- .2 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
- .3 Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets.
- .4 Use draw bolts in countertop joints.
- .5 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .6 At junction of plastic laminate counter backsplash and adjacent wall finish, apply small bead of sealant.
- .7 Apply water resistant building paper over wood framing members in contact with masonry or cementitious construction.
- .8 Fit hardware accurately and securely in accordance with manufacturer's directions.
- .9 Site apply laminated plastic to units as indicated or required. Adhere laminated

plastic over entire surface. Make corners with hairline joints. Use full sized laminate sheets. Make joints only where approved. Slightly bevel all rises.

.10 For site application offset joints in plastic laminate facing from joints in core.

.11 Vacuum clean all cavities prior to final placement of millwork.

.12 Install millwork bases before flooring is applied.

3.2 CLEANING

.1 Clean millwork and cabinet work inside cupboards and drawers and outside surfaces.

3.3 PROTECTION

.1 Protect millwork and cabinet work from damage until final inspection.

PART 1 GENERAL

- 1.1 REFERENCES
- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .2 Underwriter's Laboratories of Canada (ULC)
 - .1 ULC-S115-1995, Fire Tests of Fire stop Systems.
- 1.2 DEFINITIONS
- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
 - .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
 - .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
 - .4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.
 - .1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.
- 1.3 SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size,

-
- finish and limitations.
 - .2 Submit two copies of WHMIS MSDS -
Material Safety Data.
 - .3 Shop Drawings:
 - .1 Submit shop drawings to show location,
proposed material, reinforcement,
anchorage, fastenings and method of
installation.
 - .2 Construction details should accurately
reflect actual job conditions.
 - .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples
showing actual fire stop material
proposed for project.
 - .5 Quality assurance submittals: submit
following in accordance with Section 01 45 00
- Testing and Quality Control.
 - .1 Test reports: in accordance with CAN-
ULC-S101 for fire endurance and CAN-ULC-
S102 for surface burning
characteristics.
 - .1 Submit certified test reports from
approved independent testing
laboratories, indicating
compliance of applied fire
stopping with specifications for
specified performance
characteristics and physical
properties.
 - .2 Certificates: submit certificates signed
by manufacturer certifying that
materials comply with specified
performance characteristics and physical
properties.
 - .3 Manufacturer's Instructions: submit
manufacturer's installation instructions
and special handling criteria,
installation sequence, cleaning
procedures.
 - .4 Manufacturer's Field Reports: submit to
manufacturer's written reports within 3
days of review, verifying compliance of
Work, as described in PART 3 - FIELD
QUALITY CONTROL.
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- 1.4 QUALITY ASSURANCE
- .1 Qualifications:
 - .1 Installer: company and person
specializing in fire stopping

installations with 5 years documented
experience approved by manufacturer.

1.5 DELIVERY,
STORAGE AND
HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
- .2 Storage and Protection:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .3 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
 - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended and conforming to specified special requirements described in PART 3 .
 - .2 Fire stop system rating: 60 minutes.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .4 Fire-resistance rating of installed fire

stopping assembly in accordance with NBC.

- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PREPARATION

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
 - .1 Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

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- 3.3 INSTALLATION
- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
 - .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
 - .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
 - .4 Tool or trowel exposed surfaces to neat finish.
 - .5 Remove excess compound promptly as work progresses and upon completion.
- 3.4 SEQUENCES OF OPERATION
- .1 Proceed with installation only when submittals have been reviewed by Departmental Representative.
 - .2 Install floor fire stopping before interior partition erections.
 - .3 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
 - .4 Mechanical pipe insulation: certified fire stop system component.
 - .1 Ensure pipe insulation installation precedes fire stopping.
- 3.5 FIELD QUALITY CONTROL
- .1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
 - .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as

described in PART 1 - SUBMITTALS.

- .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

- .1 Fire stop and smoke seal at:
 - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Edge of floor slabs.
 - .3 Top of fire-resistance rated masonry and gypsum board partitions.
 - .4 Intersection of fire-resistance rated masonry and gypsum board partitions.
 - .5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - .6 Penetrations through fire-resistance rated floor slabs, ceilings.
 - .7 Openings and sleeves installed for future use through fire separations. Around mechanical and electrical assemblies penetrating fire separations.
 - .8 Rigid ducts: greater than 129 cm²: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

PART 1 GENERAL

- 1.1 SECTION INCLUDES .1 Materials, preparation and application for caulking and sealants.
- 1.2 RELATED SECTIONS .1 Section 01 33 00 - Submittal Procedures.
.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
.3 Section 01 45 00 - Testing and Quality Control.
.4 Section 01 61 00 - Common Product Requirements.
- 1.3 REFERENCES .1 American Society for Testing and Materials International, (ASTM)
.1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.
.2 Canadian General Standards Board (CGSB)
.1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
.2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
.3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
.4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
.5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
.3 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act, 1999 (CEPA).
.4 General Services Administration (GSA) - Federal Specifications (FS)
.1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

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- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .6 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- 1.4 SUBMITTALS
- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Manufacturer's product to describe.
 - .1 Caulking compound.
 - .2 Primers.
 - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
 - .3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Submit duplicate samples of each type of material and colour.
 - .5 Cured samples of exposed sealants for each color where required to match adjacent material.
 - .6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Instructions to include installation instructions for each product used.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.
- 1.6 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
 - .2 Remove from site and dispose of packaging

materials at appropriate recycling facilities.

- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Owner's Representative.
- .8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.
- .9 Fold up metal banding, flatten, and place in designated area for recycling.

1.7 PROJECT CONDITIONS

- .1 Environmental Limitations:
 - .1 Do not proceed with installation of joint sealants under following conditions:
 - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
 - .2 When joint substrates are wet.
- .2 Joint-Width Conditions:
 - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:

- .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .3 Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.

PART 2 PRODUCTS

2.1 SEALANT MATERIALS

- .1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.
- .3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Urethanes One Part.
 - .1 Non-Sag to CAN/CGSB-19.13, Type 2, MCG-2-25 MCG-2-40.
 - .2 Windows not relevant.
- .2 Acrylics One Part.
 - .1 To CGSB 19-GP-5M.
- .3 Acoustical Sealant.
 - .1 To ASTM C919.

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- .4 Butyl.
 - .1 To CGSB 19-GP-14M.
 - .5 Preformed Compressible and Non-Compressible back-up materials.
 - .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
 - .1 Extruded closed cell foam backer rod.
 - .2 Size: oversize 30 to 50 %.
 - .2 Neoprene or Butyl Rubber.
 - .1 Round solid rod, Shore A hardness 70.
 - .3 High Density Foam.
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - .4 Bond Breaker Tape.
 - .1 Polyethylene bond breaker tape which will not bond to sealant.
- 2.3 SEALANT SELECTION
- .1 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, waterclosets, basins, vanities): Sealant type: CAN/CGSB-19.13.
 - .2 Exposed interior control joints in drywall: Sealant type: CAN/CGSB-19.13.
- 2.4 JOINT CLEANER
- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
 - .2 Primer: as recommended by manufacturer.
- PART 3 EXECUTION
- 3.1 PROTECTION
- .1 Protect installed Work of other trades from staining or contamination.
- 3.2 SURFACE PREPARATION
- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and

sealants.

- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

- .1 Sealant.
 - .1 Apply sealant in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.
- .9 Curing.
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.
- .2 Cleanup.
 - .1 Clean adjacent surfaces immediately and leave Work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

PART 1 GENERAL

- 1.1 RELATED REQUIREMENTS .1 Section 09 22 16 - Non Structural Metal Framing.
- 1.2 REFERENCES .1 Aluminum Association (AA)
- .2 ASTM International
- .1 ASTM C475-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .2 ASTM C514-04(2009e1), Standard Specification for Nails for the Application of Gypsum Board.
- .3 ASTM C840-08, Standard Specification for Application and Finishing of Gypsum Board.
- .4 ASTM C954-07, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
- .5 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .6 ASTM C1047-09, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .7 ASTM C1396/C1396M-09a, Standard Specification for Gypsum Wallboard.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
- .1 AWCI Levels of Gypsum Board Finish-97.
- .4 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .5 Green Seal Environmental Standards (GS)
- .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

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- .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
 - .7 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.
 - .3 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit duplicate 300 mm long samples of corner and casing beads shadow mould cornice cap textured finishes insulating strip.
- 1.4 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
 - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .3 Storage and Handling Requirements:
 - .1 Store gypsum board assemblies materials level off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.

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- .3 Protect from weather, elements and damage from construction operations.
 - .4 Handle gypsum boards to prevent damage to edges, ends or surfaces.
 - .5 Replace defective or damaged materials with new.
 - .4 Develop Construction Waste Management Plan related to Work of this Section.
 - .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- 1.5 AMBIENT
CONDITIONS
-
- .1 Maintain temperature 10 degrees C minimum, 21 degrees C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
 - .2 Apply board and joint treatment to dry, frost free surfaces.
 - .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.
- PART 2 PRODUCTS
- 2.1 MATERIALS
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- .1 Standard board: to ASTM C1396/C1396M Type X, 16 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
 - .2 Metal furring runners, hangers, tie wires, inserts, anchors.
 - .3 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
 - .4 Resilient clips drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
 - .5 Nails: to ASTM C514.

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- .6 Steel drill screws: to ASTM C1002.
 - .7 Stud adhesive: to CAN/CGSB-71.25 ASTM C557.
 - .8 Laminating compound: as recommended by manufacturer, asbestos-free.
 - .9 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
 - .10 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
 - .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.
 - .2 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
 - .11 Joint compound: to ASTM C475, asbestos-free.
- 2.2 FINISHES
- .1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.
 - .1 Primer: VOC limit 50 g/L maximum to GS-11 SCAQMD Rule 1113.
- PART 3 EXECUTION
- 3.1 EXAMINATION
- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- 3.2 ERECTION
- .1 Do application and finishing of gypsum board to ASTM C840 except where specified

otherwise.

- .2 Install work level to tolerance of 1:1200.
- .3 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .4 Install 19 x 64 mm furring channels over existing clay masonry partitions to affix new gypsum board.
- .5 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .6 Install wall furring for gypsum board wall finishes to ASTM C840, except where specified otherwise.
- .7 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .8 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .9 Erect drywall resilient furring transversely across studs joists between the layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 38 mm common nail 25 mm drywall screw.
- .10 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply single layer gypsum board to furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
- .3 Apply 12 mm diameter bead of acoustic sealant

continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.

- .4 Apply board using stud adhesive on furring or framing laminating adhesive on base layer of gypsum board.
- .5 Install gypsum board on walls vertically to avoid end-butt joints. Install gypsum board with face side out.
- .6 Do not install damaged or damp boards.
- .7 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install shadow mould at gypsum board/ceiling juncture. Minimize joints; use corner pieces and splicers.
- .5 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- .6 Provide continuous polyethylene dust barrier behind and across control joints.
- .7 Locate control joints at changes in substrate construction at approximate 10 m spacing on long corridor runs.
- .8 Install control joints straight and true.

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- .9 Splice corners and intersections together and secure to each member with 3 screws.
 - .10 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
 - .11 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
 - .12 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
 - .1 Levels of finish:
 - .1 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
 - .13 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
 - .14 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
 - .15 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
 - .16 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
 - .17 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

- .18 Mix joint compound slightly thinner than for joint taping.
- .19 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .20 Allow skim coat to dry completely.
- .21 Remove ridges by light sanding or wiping with damp cloth.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by gypsum board assemblies' installation.

PART 1 GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
 - .2 Section 07 92 00 - Joint Sealants.
 - .3 Section 09 21 16 - Gypsum Board Assemblies.
- 1.2 REFERENCES
- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C645-00, Specification for Nonstructural Steel Framing Members.
 - .2 ASTM C754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.
 - .3 Environmental Choice Program (ECP).
 - .1 CCD-047a -98, Paints - Surface Coatings.
 - .2 CCD-048-98, Surface Coatings - Recycled Water-borne.
- 1.3 QUALITY ASSURANCE
- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
 - .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- 1.4 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management

Plan.

- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.
- .5 Divert unused gypsum materials from landfill to recycling facility approved by Departmental Representative.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C645, stud sizes indicated, roll formed from 0.91 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board lath. Knock-out service holes at 460 mm centres.
- .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.
- .3 Metal channel stiffener:, 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .4 Acoustical sealant: to 07 92 00 - Joint Sealants.

PART 3 EXECUTION

3.1 ERECTION

- .1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 400 mm on centre and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .4 Erect metal studding to tolerance of 1:1000.
- .5 Attach studs to bottom and ceiling track using screws.
- .6 Co-ordinate simultaneous erection of studs

-
- with installation of service lines. When erecting studs ensure web openings are aligned.
- .7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
 - .8 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
 - .9 Install heavy gauge single jamb studs at openings and elsewhere as indicated.
 - .10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
 - .11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
 - .12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
 - .13 Install steel studs or furring channel between studs for attaching electrical and other boxes.
 - .14 Extend partitions to underside deck above except where noted otherwise on drawings.
 - .15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks. Use double track slip joint as indicated.
 - .16 Install continuous insulating strips to isolate studs from uninsulated surfaces.
 - .17 Install two continuous beads of acoustical

sealant insulating strip under studs and tracks around perimeter of sound control partitions.

- 3.2 CLEANING .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

PART 1 GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 45 00 - Quality Control.
 - .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .4 Section 01 78 00 - Closeout Submittals.
 - .5 Section 06 10 00 - Rough Carpentry.
 - .6 Section 09 21 16 - Gypsum Board Assemblies.
 - .7 Section 09 53 00 - Acoustical Suspension.
- 1.2 REFERENCES
- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM E1264, Classification for Acoustical Ceiling Products.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-92.1, Sound Absorptive Prefabricated Acoustical Units.
 - .3 Canadian Standards Association (CSA)
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .4 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102, Surface Burning Characteristics of Building Materials and Assemblies.
- 1.3 SUBMITTALS
- .1 Submit duplicate full size samples of each type acoustical units.
- 1.4 MOCK-UP
- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up 10 m2 minimum of each type acoustical tile ceiling including: one inside corner, one outside corner.
 - .3 Construct mock-up where directed.

- .4 Allow 48 hours for inspection of mock-up by Owner's Representative before proceeding with ceiling work.
- .5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of the finished work.

1.5 ENVIRONMENTAL
REQUIREMENTS

- .1 Permit wet work to dry before commencement of installation.
- .2 Maintain uniform minimum temperature of 15°C and humidity of 20 - 40% before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

1.6 EXTRA
MATERIALS

- .1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide acoustical units amounting to 2% of gross ceiling area for each pattern and type required for project.
- .3 Extra materials to be from same production run as installed materials.
- .4 Clearly identify each type of acoustic unit, including colour and texture.
- .5 Deliver to Departmental Representative, upon completion of the work of this section.
- .6 Store where directed by Departmental Representative.

1.7 CLOSEOUT
SUBMITTALS

- .1 Provide maintenance data for acoustical ceilings for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Acoustic units for suspended ceiling system: to ASTM E1264, Type 4, pattern "E" Fire Class A.

- .1 Water repellent, washable, scrubbable.
- .2 Suitable for clean rooms up to 150 Class 5
- .3 Pattern "E".
- .4 Flame spread rating of 25 or less in accordance with CAN/ULC-S102.
- .5 Smoke developed 50 or less in accordance with CAN/ULC-S102.
- .6 Noise reduction coefficient (NRC) designation of 0.70.
- .7 Ceiling Attenuation Class (CAC), in accordance with ASTM E1264.
- .8 Light reflectance range of 0.86.
- .9 Edge type square.
- .10 Colour white.
- .11 Size 610 x 610 x 19 mm thick.
- .12 Shape flat.
- .13 Acceptable product: Armstrong Health Zone Ultima 15/16" square lay in.

PART 3 EXECUTION

- 3.1 EXAMINATION .1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Owner's Representative.
- 3.2 INSTALLATION .1 Install acoustical panels and tiles in ceiling suspension system.
- .2 In fire rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.
- 3.3 APPLICATION .1 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width. Refer to reflected ceiling plan.
- .2 Scribe acoustic units to fit adjacent work butt joints tight, terminate edges with moulding.

3.4 INTERFACE
WITH OTHER WORK

- .1 Coordinate with Section 09 53 00.01 -
Acoustical Suspension.
- .2 Co-ordinate ceiling work to accommodate
components of other sections, such as light
fixtures, diffusers, speakers, sprinkler
heads, to be built into acoustical ceiling
components.

3.5 COMMISSIONING

- .1 Train user staff in the care, cleaning and
replacement of acoustical ceiling tile.
- .2 Acceptance of maintenance material turned
over to owner.

PART 1 GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 01 33 00 - Submittal Procedures
 - .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .3 Section 09 21 16 - Gypsum Board Assemblies.
 - .4 Section 09 51 13 - Acoustical Panel Ceilings.
 - .5 Division 22: Trim for recessed mechanical fixtures.
 - .6 Division 26: Trim for recessed light fixtures.
- 1.2 REFERENCES
- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM C635, Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C636, Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- 1.3 DESIGN REQUIREMENTS
- .1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.
- 1.4 SUBMITTALS
- .1 Submit reflected ceiling plans for special grid patterns as indicated.
 - .2 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines change in level details, access door dimensions, and locations and acoustical unit support at ceiling fixture lateral bracing and accessories.
 - .3 Submit one representative model of each type ceiling suspension system.
 - .4 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Intermediate duty system to ASTM C635.
- .2 Basic materials for suspension system:
commercial quality vinyl coated, washable lab
grade cold rolled steel, zinc coated.
- .3 Suspension system: non fire rated, made up as
follows:
 - .1 two directional exposed tee bar grid.
- .4 Exposed tee bar grid components: vinyl coated
washable lab grade shop painted satin sheen
white colour. Components die cut. Main tee
with double web, rectangular bulb and 25 mm
rolled cap on exposed face. Cross tee with
rectangular bulb; web extended to form
positive interlock with main tee webs; lower
flange extended and offset to provide flush
intersection.
- .5 Hanger wire: galvanized soft annealed steel
wire.
 - .1 3.6 mm diameter for access tile
ceilings.
- .6 Hanger inserts: purpose made.
- .7 Accessories: splices, clips, wire ties,
retainers and wall moulding to be shadow
mould, to complement suspension system
components, as recommended by system
manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Installation: in accordance with ASTM C636
except where specified otherwise.
- .2 Install suspension system to manufacturer's
instructions.
- .3 Do not erect ceiling suspension system until
work above ceiling has been inspected by
Owner's Representative.
- .4 Secure hangers to overhead structure using
attachment methods acceptable to Owner's
Representative.

- .5 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .6 Lay out system according to reflected ceiling plan.
- .7 Ensure suspension system is co-ordinated with location of related components.
- .8 Install wall moulding to provide correct ceiling height.
- .9 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.
- .10 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .11 Interlock cross member to main runner to provide rigid assembly.
- .12 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .13 Install access splines to provide 10% ceiling access.
- .14 Finished ceiling system to be square with adjoining walls and level within 1:1000.

3.2 CLEANING

- .1 Touch up scratches, abrasions, voids and other defects in painted surfaces.

PART 1 GENERAL

- 1.1 REFERENCES .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).
- 1.2 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
 - .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base, edge strips.
 - .4 Closeout Submittals:
 - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.3 DELIVERY, STORAGE AND HANDLING .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- 1.4 AMBIENT CONDITIONS .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees for 48 hours before, during and 48 hours after installation.
- 1.5 MAINTENANCE .1 Extra Materials:
- .1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide 2 m2 of each colour, pattern and type flooring material required for project for maintenance use.

- .3 Extra materials one piece and from same production run as installed materials.
- .4 Identify each roll of sheet flooring and each container of adhesive.
- .5 Deliver to Departmental Representative, upon completion of the work of this section.
- .6 Store where directed by Departmental Representative.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Homogeneous sheet PVC flooring:
 - .1 Construction: Homogeneous
 - .2 Product Line: I Medintech
 - .3 International Product Specifications: ASTM F 1913, ISO 10581, Type II
 - .4 Overall thickness: 2.0 mm
 - .5 Wear Layer thickness: 2.0mm
 - .6 Finish: UV-cured Polyurethane
 - .7 Installation: Full spread adhesives - S-599 Premium
 - .8 Seaming Options: Heat weld with solid weld rods or S-761.
 - .9 Maintenance Options: No polish - Spray/Dry/No Buff.
 - .10 Roll length: Up to 25 m.
 - .11 Width: 1.83 m.
- .2 Performance

<u>Performance</u>	<u>Test Method</u>	<u>Minimum Requirement</u>	<u>Performance vs. Requirement</u>
Thickness	ASTM F 386	≥ 0.075 in.	Exceeds
Residual Indentation	ASTM F 1914	≤ 0.007 in.	Exceeds
Static Load Resistance (250 psi)	ASTM F 970	≤ 0.005 in.	Exceeds
Flexibility	ASTM F 137	1 ½ in.	Exceeds
Chemical Resistance	ASTM F 925	No more than slight change in surface dulling, attack or staining.	Meets or Exceeds
Resistance to Heat	ASTM F 1514	$\Delta E \leq 8$	Exceeds
Resistance to Light	ASTM F 1515	$\Delta E < 8$	Exceeds

Fire Test Data - Flame Spread	ASTM E 648	0.45 W/cm ² or more, Class 1	Meets
Fire Test Data - Smoke Evolution	ASTM E 662	450 or less	Meets
Fire test Data - Canada	CAN/ULC S102.2	Use dependent	Flame Spread- 100, Smoke Developed-280
Static Load Limit - Subjective Visual	ASTM F 970	No Visually apparent indentation	750 psi
Certified Low Emitting Product	LEED® EQ4.3	Meets Guidelines	Meets
Certified Low Emitting Adhesive	LEED® EQ4.1	Meets Guidelines	Meets
Plant Certification	ISO 14001	Meets Certification Guidelines	Certified
Indoor Air Quality	FloorScore™	Meets Certification Guidelines	Certified
Indoor Air Quality	CHPS 01350	Meets Certification Guidelines	Certified

.3 Warranty:

- .1 5 Year commercial warranty when installed in accordance with Armstrong's Guaranteed Installation Systems manual, F-5061.

.4 Colours:

- .1 To be selected from manufacturers standard colour palette of a minimum of 18 colours.

.5 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

.1 Floor adhesives:

- .1 Adhesive: maximum VOC limit 60 g/L to SCAQMD Rule 1168.

.2 Cove base adhesives:

- .1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.6 Sub floor filler and leveller: white premix latex requiring water only to produce cementitious paste as recommended by flooring manufacturer for use with their product.

.7 Metal edge strips:

- .1 Aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder

		flush with top of adjacent floor finish.
	.8	Edging to floor penetrations: aluminum, type recommended by flooring manufacturer.
	.9	Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.
<u>2.2 STANDARD OF ACCEPTANCE</u>	.1	Medintech by Armstrong
	.2	Resilient base:
	.1	Type: rubber
	.2	Style: cove
	.3	Thickness: 2.03mm
	.4	Hright: 101.6mm
	.5	Lengths: cut lengths minimum 1200mm
	.6	Colours: selected by Departmental Representative from a minimum palette of 36 colours.
 PART 3 EXECUTION		
<u>3.1 MANUFACTURER'S INSTRUCTIONS</u>	.1	Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
<u>3.2 SITE VERIFICATION OF CONDITIONS</u>	.1	Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.
<u>3.3 PREPARATION</u>	.1	Remove existing flooring, bases, setting beds, adhesives and provide floor leveller, fill, level, grind and prepare floors to accept new finishes.
	.2	Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
	.3	Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
	.4	Prime and seal concrete slab to resilient flooring manufacturer's printed instructions.
3.4 APPLICATION:	.1	Provide high ventilation rate, with maximum

FLOORING

outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.

- .2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- .4 Run sheets in direction of traffic. Double cut sheet joints and continuously seal heat weld according to manufacturer's printed instructions.
- .5 Heat weld seams of sheet flooring with colour matched PVC rods in accordance with manufacturer's printed instructions.
- .6 As installation progresses, and after installation, roll flooring with 45 kg minimum roller to ensure full adhesion.
- .7 Cut flooring around fixed objects.
- .8 Install flooring in pan type floor access covers. Maintain floor pattern.
- .9 Continue flooring over areas which will be under built-in furniture.
- .10 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .11 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 APPLICATION:
BASE

- .1 Lay out base to keep number of joints at minimum.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.

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- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
 - .5 Install straight and level to variation of 1:1000.
 - .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
 - .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.
 - .8 Install base 100 mm height.

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Remove excess adhesive from floor, base and wall surfaces without damage.
- .3 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.7 PROTECTION

- .1 Protect new floors from time of final set of adhesive after initial waxing until final waxing.
- .2 Prohibit traffic on floor for 48 hours after installation.

PART 1 GENERAL

1.1 SUMMARY

- .1 Section Includes:
 - .1 Material and installation of site applied paint finishes to new interior surfaces, including site painting of shop primed surfaces.
 - .2 Sustainable requirements for construction and verification:
- .2 Related Sections:
 - .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 35 28 - Health and Safety Requirements.
 - .3 Section 01 45 00 - Testing and Quality Control.
 - .4 Section 01 61 00 - Common Product Requirements.
 - .5 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .6 Section 01 78 00 - Closeout Submittals.

1.2 REFERENCES

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33
- .2 Environmental Protection Agency (EPA)
 - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 National Fire Code of Canada - 1995
- .6 Society for Protective Coatings (SSPC)

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- .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
 - .7 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- 1.3 QUALITY ASSURANCE
- .1 Qualifications:
 - .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
 - .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
 - .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.
 - .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 28 - Health and Safety Requirements.
- 1.4 SCHEDULING
- .1 Submit work schedule for various stages of painting to Departmental Representative for review. Submit schedule minimum of 48 hours in advance of proposed operations.
 - .2 Obtain written authorization from Departmental Representative for changes in work schedule.
 - .3 Schedule painting operations to prevent disruption of occupants.
- 1.5 SUBMITTALS
- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit product data and instructions for each paint and coating product to be used.

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- .2 Submit product data for the use and application of paint thinner.
 - .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application and curing.
 - .3 Samples:
 - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
 - .2 Submit duplicate 200 x 300 mm sample panels of each paint stain clear coating special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 13 mm birch plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
 - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
 - .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Lead, cadmium and chromium: presence of and amounts.
 - .2 Mercury: presence of and amounts.
 - .3 Organochlorines and PCBs: presence of and amounts.

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- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .6 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation and application instructions.
 - .7 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.
- 1.6 MAINTENANCE
- .1 Extra Materials:
 - .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
 - .2 Quantity: provide - one four litre can of each type and colour of primer stain finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
 - .3 Delivery, storage and protection: comply with Departmental Representative requirements for delivery and storage of extra materials.
- 1.7 DELIVERY, STORAGE AND HANDLING
- .1 Packing, Shipping, Handling and Unloading:
 - .1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.

- .2 Acceptance at Site:
 - .1 Identify products and materials with labels indicating:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
 - .1 Provide and maintain dry, temperature controlled, secure storage.
 - .2 Store materials and supplies away from heat generating devices.
 - .3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.
- .8 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with

National Fire Code of Canada requirements.

.9 Waste Management and Disposal:

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
- .4 Separate for recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan (WMP).
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .7 Ensure emptied containers are sealed and stored safely.
- .8 Unused paint coating materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.
- .9 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .11 Place materials defined as hazardous or toxic waste,

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- including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .12 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
- .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
 - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
 - .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
 - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .14 Set aside and protect surplus and uncontaminated finish materials: Deliver to or arrange collection by organizations for verifiable re-use or re-manufacturing.

1.8 SITE
CONDITIONS

- .1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces.
 - .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Provide continuous ventilation for seven days after completion of

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- application of paint.
- .4 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
 - .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
 - .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Unless pre-approved written approval by specifying body and product manufacturer, perform no painting when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - .4 The relative humidity is under 85 % or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
 - .5 Ensure that conditions are within specified limits during drying or curing

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- process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
- .2 Perform painting work when maximum moisture content of the substrate is below:
 - .1 15 % for wood.
 - .2 12 % for plaster and gypsum board.
 - .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
 - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
- .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Additional interior application requirements:
- .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Paint materials listed in the MPI Approved Products List (APL) are

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- acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
 - .3 Conform to latest MPI requirements for interior painting work including preparation and priming.
 - .4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
 - .5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
 - .6 Provide paint products meeting MPI "Environmentally Friendly", E2 ratings based on VOC (EPA Method 24) content levels.
 - .7 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
 - .8 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
 - .1 Water-based Water soluble Water clean-up.
 - .2 Non-flammable biodegradable.
 - .3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .4 Manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
 - .9 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

- .10 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .11 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
 - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .12 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .13 Recycled water-borne surface coatings to contain 50 % post-consumer material by volume.
- .14 Recycled water-borne surface coatings must not contain:
 - .1 Lead in excess of 600.0 ppm weight/weight total solids.
 - .2 Mercury in excess of 50.0 ppm weight/weight total product.
 - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
 - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
 - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.2 COLOURS

- .1 Departmental Representative will provide Colour Schedule after Contract award.
- .2 Colour schedule will be based upon selection of one base colour and two

accent colours. No more than three colours will be selected for entire project.

- .3 Selection of colours from manufacturer's full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Departmental Representative for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 GLOSS/SHEEN RATINGS

- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

	Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level 1 - Matte Finish (flat)	Max. 5	Max. 10
Gloss Level 2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	

Gloss Level 7 - High Gloss Finish More than 85

- .2 Gloss level ratings of painted surfaces as indicated and as noted on Finish Schedule.
- 2.5 INTERIOR PAINTING SYSTEMS
- .1 Structural steel and metal fabrications: columns, beams, joists:
 - .1 INT 5.1A - Quick dry enamel semi-gloss finish.
 - .2 Galvanized metal: frames, misc. steel, pipes, and ducts.
 - .1 INT 5.3A - Latex insert gloss level 65 finish.
 - .3 Dimension lumber: columns, beams, exposed joists:
 - .1 INT 6.2A - Latex insert gloss level 65 finish (over alkyd primer).
 - .4 Dressed lumber: including doors, door and window frames, casings, mouldings:
 - .1 INT 6.3A - High performance architectural latex insert gloss level 65 finish.
 - .5 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
 - .1 INT 9.2A - Walls Latex insert gloss level G4 finish (over latex sealer).
- 2.6 SOURCE QUALITY CONTROL
- .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
 - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
 - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
 - .3 Organochlorines and PCBs are to be

determined by Gas Chromatography
using Technique no. 8081 as
defined in EPA SW-846.

PART 3 EXECUTION

3.1 MANUFACTURER'S
INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 GENERAL

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Stucco, plaster and gypsum board: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.4 PREPARATION

- .1 Protection:

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- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
 - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
 - .3 Protect factory finished products and equipment.
 - .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .2 Surface Preparation:
- .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
 - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
 - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
- .1 Prime all currently oil painted surfaces prior to application of latex finish.
 - .2 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - .3 Wash surfaces with a biodegradable detergent and bleach where

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- applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .4 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .5 Allow surfaces to drain completely and allow to dry thoroughly.
 - .6 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
 - .7 Use trigger operated spray nozzles for water hoses.
 - .8 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
 - .4 Clean following surfaces with high pressure water washing.
 - .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
 - .6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
 - .2 Apply wood filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
 - .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
 - .8 Clean metal surfaces to be painted by removing rust, loose mill scale, welding

slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.

.9 Touch up of shop primers with primer as specified.

.10 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

.11 Prime existing oil painted surfaces prior to application of latex finishes.

3.5 APPLICATION

.1 Method of application to be as approved by Departmental Representative. Apply paint by brush roller airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in uniform layer using brush and/or roller type suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly

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- mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
 - .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
 - .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
 - .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
 - .7 Sand and dust between coats to remove visible defects.
 - .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
 - .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
 - .10 Finish closets and alcoves as specified for adjoining rooms.
 - .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- 3.6 MECHANICAL/
ELECTRICAL
EQUIPMENT
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- .1 Paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces,

except as indicated.

- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Do not paint over nameplates.
- .4 Keep sprinkler heads free of paint.
- .5 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .6 Paint fire protection piping red.
- .7 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .8 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .9 Do not paint interior transformers and substation equipment.

3.7 SITE TOLERANCES

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 FIELD QUALITY CONTROL

- .1 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

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- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
 - .2 Field inspection of painting operations to be carried out by independent inspection firm as designated by Departmental Representative.
 - .3 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
 - .4 Cooperate with inspection firm and provide access to areas of work.
 - .5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

3.9 RESTORATION

- .1 Clean and re install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

PART 1 GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 35 28 - Health and Safety Requirements.
 - .3 Section 01 74 21 - Construction / Demolition Waste Management and Disposal.
 - .4 Section 01 78 00 - Closeout Submittals.
 - .5 02 41 16.01 - Structure Demolition - Short Form
 - .6 08 82 00.02 - Asbestos Abatement - Intermediate Precautions
- 1.2 SUBMITTALS
- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Shop drawings; submit drawings stamped and signed for approval by Departmental Representative.
 - .3 Shop drawings to show:
 - .1 Mounting arrangements.
 - .2 Operating and maintenance clearances.
 - .4 Shop drawings and product data 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 current model production.
 - .5 Certification of compliance to applicable codes.
 - .5 Closeout Submittals:
 - .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

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- .2 Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
 - .3 Operation data to include:
 - .1 Control schematics for systems including environmental controls.
 - .2 Description of systems and their controls.
 - .3 Operation instruction for systems and component.
 - .4 Maintenance data to include:
 - .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
 - .5 Approvals:
 - .1 Submit 2 copies of draft Operation and Maintenance Manual to Departmental Representative for approval. Submission of individual data will not be accepted unless directed by Departmental Representative.
 - .2 Make changes as required and re-submit as directed by Departmental Representative.
 - .6 Site records:
 - .1 Departmental Representative will provide 1 set of reproducible mechanical drawings or AutoCAD files. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
 - .2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.
 - .3 Use different colour for each service.
 - .4 Make available for reference purposes and inspection.
 - .7 As-built drawings:
 - .1 Identify each drawing in lower right hand corner in letters at

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- least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
- .2 Submit to Departmental Representative for approval and make corrections as directed.
 - .3 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.
 - .8 Submit copies of as-built drawings for inclusion in final TAB report.
- 1.3 QUALITY ASSURANCE
- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
 - .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 28 - Health and Safety Requirements.
- 1.4 MAINTENANCE
- .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.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- .1 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- 1.6 WARRANTY
- .1 Provide a written guarantee, signed and issued in the name of the owner, against defective materials and workmanship for a period of one (1) year from the date of Substantial Completion.
- PART 2 PRODUCTS
- 2.1 MATERIALS
- .1 All materials used on this project shall be new and CSA approved unless noted otherwise.

2.2 DUCTWORK

- .1 Galvanized Steel:
 - .1 Lock forming quality: to ASTM A653, G90 zinc coating.
 - .2 Thickness, fabrication and reinforcement: SMACNA.
 - .3 Joints: to SMACNA or propriety manufactured flanged duct joint to be considered to a class A seal.
- .2 Stainless Steel:
 - .1 To ASTM A480/A480M, Type 304.
 - .2 Finish: No. 4 finish on exposed side of duct in finished areas, No. 3 finish or lower where concealed.
 - .3 Thickness, fabrication and reinforcement: to SMACNA.
 - .4 Joints: to SMANCA and be continuous inert gas welded.
- .3 Hangers and Supports:
 - .1 Strap hangers: of same material as duct but next sheet metal thickness heavier than duct. Maximum size duct supported by strap hanger: 500 mm.
 - .2 Hanger configuration: to SMACNA.
 - .3 Hangers: galvanized steel angle with black steel rods to ASHRAE or SMACNA following table:

<u>Duct Size (mm)</u>	<u>Angle Size (mm)</u>	<u>Rod Size (mm)</u>
up to 750	25 x 25 x 3	6
- .4 Upper Hanger Attachments:
 - .1 For concrete: manufactured concrete inserts.
 - .1 Acceptable Product: Myatt, Grinnell, Hunt.
 - .2 For steel joist: manufactured joist clamp steel plate washer.
 - .1 Acceptable Product: Myatt, Grinnell, Hunt.
 - .3 For steel beams: manufactured beam clamps.
 - .1 Acceptable Product: Myall, Grinnell, Hunt.
- .5 Installers to be certified to journeyperson level in sheet metal work.

PART 3 EXECUTION

3.1 DUCTWORK

- .1 General:
- .1 Do work in accordance with NFPA 90A, NFPA 90B, and SMACNA.
 - .2 Do not break continuity of insulation vapour barrier with hangers or rods. Insulate strap hangers 100 mm beyond insulated duct.
 - .3 Support risers in accordance with SMACNA.
 - .4 Install breakaway joints in ductwork on sides of fire separation. Do not place fire stopping material in expansion space between damper sleeve and fire partition.
 - .5 Install proprietary manufactured flanged duct joints in accordance with manufacturer's instructions.
 - .6 Manufacture duct in lengths and diameter to accommodate installation of acoustic duct lining.
 - .7 Extend ductwork for supply air diffusers to facilitate the installation of new ceilings. Refer to architectural drawings for new ceiling heights. Match existing duct materials and joining materials.
 - .8 Existing exhaust ductwork is stainless steel welded. New ductwork for this to match material and gauge of existing and be all welded. Coordinate connection of new stainless steel welded ductwork with existing in the field.

3.2 ASBESTOS
ABATEMENT

- .1 Asbestos abatement is part of this project. All abatement will be performed by others. Coordinate with the general Contractor, the Asbestos Contractor and other trades, the timing for mechanical systems removal and reinstallation as applicable.

3.3 SELECTIVE
DEMOLITION

- .1 Coordinate all selective demolition work with Departmental Representative including but not limited to: services to be removed completely; services to be removed and reinstalled; routing of new services; location of new services in casework chases, location of mechanical components in new casework and connection of mechanical services to the same.
- .2 Carry out all demolition work in a neat and orderly manner.
- .3 Keep noise, dust, and similar nuisances to a minimum.
- .4 Do not collapse walls.
- .5 Do not throw or drop materials.
- .6 Where material indicated to be removed is suspected of containing asbestos, inform Departmental Representative immediately. Do not disturb materials suspected of containing asbestos until asbestos content has been verified by Owner's Representative.
- .7 Use extreme caution when cutting into shafts and chases. Shafts and chases may end above occupied areas within building. Take all necessary precautions to prevent debris from falling through openings between floors during demolition operations. Comply with requirements of Division.
- .8 01 50 00 Section "Temporary Facilities".

3.4 CONNECTION
OF NEW SERVICES TO
EXISTING SERVICES

- .1 Repair existing services to remain inadvertently damaged with materials to match existing.
- .2 Connect new services to existing. Exact locations to be field determined.

3.5 REMOVED AND
REINSTALLED ITEMS

- .1 Clean and repair items to functional condition adequate for intended reuse.
- .2 Pack or crate items after cleaning and repairing. Identify contents of containers.
- .3 Protect items from damage during transport and storage.
- .4 Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports

3.6 EXISTING

- .1 Protect construction indicated to remain against damage and soiling during

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- ITEMS TO REMAIN selective demolition. When permitted by Departmental Representative, items may be removed to a suitable, protected storage location off-site during selective demolition and reinstalled in their new locations after selective demolition operations are complete.
- 3.7 WORK HOURS .1 Building 25 is occupied during regular working hours from 9:00 a.m. to 5:00 p.m. Coordinate work with the Departmental Representative, including after hour work and on weekends to minimize disruption to building operations and staff. The building is a secure site and all trades will require security passes at the beginning of each shift. Coordinate the same with the Departmental Representative. Delays in access to site may be experienced during the execution of this project. Include cost in Bid in relation to the same.
- 3.8 PAINTING, REPAIRS AND RESTORATION .1 Do painting in accordance with Section 09 91 23 - Interior Painting.
.2 Prime and touch up marred finished paintwork to match original.
.3 Restore to new condition, finishes which have been damaged.
- 3.9 CLEANING .1 Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.
- 3.10 PROTECTION .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.
- 3.11 CONTROLS MODIFICATIONS .1 Controls for a number of buildings including Building 25 will be ongoing during the execution of this work. All control work for this project (demolition and new) shall be by "Controls Upgrade Contractor". In relation to the controls, coordinate the integration of the controls for the lab with the General Contractor and the "Controls Upgrade and the Contractor" including timing of disconnection of the existing pneumatic and electronic

controls and existing equipment and the
installation of the new electronic controls
and equipment.

PART 1 GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 35 28 - Health and Safety Requirements.
 - .3 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
 - .4 Section 01 78 00 - Closeout Submittals.
 - .5 Section 01 91 13 - General Commissioning (CX) Requirements
 - .6 Section 21 05 01 - Common Work Results for Mechanical.
- 1.2 REFERENCES
- .1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME).
 - .1 ANSI/ASME B16.15, Cast Bronze Threaded Fittings, Classes 125 and 250.
 - .2 ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
 - .3 ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
 - .4 ANSI/ASME B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500.
 - .2 American National Standards Institute/National Sanitation Foundation (ANSI/NSF).
 - .1 ANSI/NSF 61, Drinking Water System Components.
 - .3 American Society for Testing and Materials International (ASTM).
 - .1 ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .2 ASTM A536, Standard Specification for Ductile Iron Castings.
 - .3 ASTM B 88M, Standard Specification for Seamless Copper Water Tube (Metric).
 - .4 ASTM F 492, Standard Specification for

Propylene and Polypropylene (PP)
Plastic-Lined Ferrous Metal Pipe
Fittings.

- .4 American Water Works Association (AWWA).
 - .1 AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - .2 AWWA C606, Grooved and Shouldered Joints.
 - .5 Canadian Standards Association (CSA International).
 - .1 CSA B242, Groove and Shoulder Type Mechanical Pipe Couplings.
 - .6 Department of Justice Canada (Jus).
 - .1 Canadian Environmental Protection Act (CEPA).
 - .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
 - .8 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).
 - .1 MSS-SP-67, Butterfly Valves.
 - .2 MSS-SP-70, Cast Iron Gate Valves, Flanged and Threaded Ends.
 - .3 MSS-SP-71, Cast Iron Swing Check Valves, Flanged and Threaded Ends.
 - .4 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.
 - .9 National Research Council (NRC)/Institute for Research in Construction.
 - .1 NRCC 38728, National Plumbing Code of Canada (NPC).
 - .10 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act (TDGA).
- 1.3 SUBMITTALS
- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Provide manufacturer's printed product literature and datasheets for insulation and adhesives, and include product

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- characteristics, performance criteria,
physical size, finish and limitations.
- .3 Submit WHMIS MSDS - Material Safety Data
Sheets in accordance with Section 02 62 00.01
- Hazardous Materials.
 - .4 Closeout Submittals:
 - .1 Provide maintenance data for
incorporation into manual specified in
Section 01 78 00 Closeout Submittals.
 - .5 Grooved joint couplings and fittings to be
indicated on product submittals and to be
specifically identified with the applicable
style or series designation.
- 1.4 HEALTH AND SAFETY
- .1 Do construction occupational health and
safety in accordance with Section 01 35 28 -
Health and Safety Requirements.
- 1.5 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate waste materials for reuse and
recycling in accordance with Section 01 74 21
- Construction/Demolition Waste Management
and Disposal.
 - .2 Remove from site and dispose of packaging
materials at appropriate recycling
facilities.
 - .3 Separate for reuse and recycling and place in
designated containers Steel, Metal, Plastic
waste in accordance with Waste Management
Plan.
 - .4 Place materials defined as hazardous or toxic
in designated containers.
 - .5 Handle and dispose of hazardous materials in
accordance with CEPA, TDGA, Regional and
Municipal regulations.
 - .6 Fold up metal banding, flatten and place in
designated area for recycling.

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- 2.1 PIPING
- .1 Domestic hot, cold and recirculation systems, within building.
 - .1 Above ground: copper tube, hard drawn, type L: to ASTM B88M.
 - .2 Buried or embedded: copper tube, soft annealed, type K: to ASTM B88M, in long lengths and with no buried joints.
- 2.2 FITTINGS
- .1 Bronze pipe flanges and flanged fittings, Class 150 and 300: to ANSI/ASME B16.24.
 - .2 Cast bronze threaded fittings, Class 125 and 250: to ANSI/ASME B16.15.
 - .3 Cast copper, solder type: to ANSI/ASME B16.18.
 - .4 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.
 - .5 NPS2 and larger: roll grooved to CSA B242. Cast bronze to ANSI/ASME B16.18 or wrought copper ANSI/ASME B16.22.
 - .1 Fittings to be manufactured to copper-tube dimensions. Flaring of tube or fitting ends to accommodate IPS sized couplings is not permitted.
 - .6 NPS 1 ½ and under: Cast copper, ANSI/ASME B16.18 or wrought copper, ANSI/ASME B16.22; with 301 stainless steel internal components, EPDM seal, and push-to-connect or press fit joints, for hard drawn copper tube type L or K, rated for 1300 kPa at ASTM B88.
- 2.3 JOINTS
- .1 Rubber gaskets, latex-free, 1.6 mm thick: to ANSI/AWWA C111.
 - .2 Bolts, nuts, hex head and washers: to ASTM A307, heavy series.
 - .3 Solder: 95/5 tin copper alloy lead free.
 - .4 Push-to-connect: EPDM gasket, UL classified in accordance with ANSI/NSF 61 for potable water service.
 - .5 Teflon tape: for threaded joints.
 - .6 Grooved couplings: designed with angle bolt

pads to provide rigid joint, complete with EPDM flush seal gasket. Gasket to be classified in accordance with ANSI/NSF 61 for potable water service. Couplings to be manufactured to copper-tube dimensions. Flaring of tube or fitting ends to accommodate IPS sized couplings is not permitted.

- .7 Dielectric connections between dissimilar metals: dielectric fitting to ASTM F492, complete with thermoplastic liner.

2.4 GLOBE VALVES

- .1 NPS2 and under, soldered:
 - .1 To MSS-SP-80, Class 125, 860 kPa, bronze body, renewable composition disc, screwed over bonnet as specified Section 23 05 23.01 - Valves - Bronze.
 - .2 Lockshield handles.

2.5 BALL VALVES

- .1 NPS2 and under:
 - .1 Body and cap: cast high tensile bronze to ASTM B16 or ASTM B62.
 - .2 Pressure rating: Class 125,860 MPa steam.
 - .3 Connections: screwed ends to ANSI B1.20.1 and with hex. shoulders. Push-to-connect, Pressfit ends.
 - .4 Stem: tamperproof ball drive.
 - .5 Stem packing nut: external to body.
 - .6 Ball and seat: replaceable stainless steel or hard chrome, plated brass solid ball and teflon seats.
 - .7 Stem seal: TFE, EPDM, Nitrile, Flouroelastomer with external packing nut.
 - .8 Operator: removable lever handle with extension for insulated pipe.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install in accordance with Canadian Plumbing Code and local authority having jurisdiction.

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- .2 Assemble piping using fittings manufactured to ANSI standards.
 - .3 Install CWS piping below and away from HWS and HWR and other hot piping so as to maintain temperature of cold water as low as possible.
 - .4 Connect to fixtures and equipment in accordance with manufacturer's written instructions unless otherwise indicated.
- 3.2 VALVES
- .1 Isolate equipment, fixtures and branches with butterfly or ball valves.
- 3.3 PRESSURE TESTS
- .1 Conform to requirements of Section 21 05 01 - Common Work Results-Mechanical.
 - .2 Coordinate testing with Departmental Representative. Slowly release water to new hot and cold water piping pressure. Slowly increase pressure to available. Check for leaks. Repair leaks, and retest to the Departmental Representative's satisfaction.
- 3.4 FLUSHING AND CLEANING
- .1 Flush entire system for 8 h. Ensure outlets flushed for 2 h. Let stand for 24 h, then draw one sample off longest run. Submit to testing laboratory for bacteriological testing to verify that system is clean to Provincial potable water guidelines. Let system flush for additional 2 h, then draw off another sample for testing.
- 3.5 DISINFECTION
- .1 Flush out, disinfect and rinse system to requirements of authority having jurisdiction and approval of Departmental Representative.
 - .2 Upon completion, provide laboratory test reports on water quality to Departmental Representative.
- 3.6 START-UP
- .1 Timing: Start up after:
 - .1 Pressure tests have been completed.
 - .2 Disinfection procedures have been completed.
 - .3 Check control, limit, safety devices for normal and safe operation.

.4 Rectify start-up deficiencies.

PART 1 GENERAL

- 1.1 SUMMARY .1 Section includes:
- .1 The installation of drainage waste and vent piping - corrosion resistant.
- 1.2 RELATED SECTIONS .1 Section 01 33 00 - Submittals Procedures
- .2 Section 01 35 28 - Health and Safety Requirements
 - .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal
 - .4 Section 01 78 00 - Closeout Submittals
 - .5 02 41 16.01 - Structure Demolition - Short Form
 - .6 08 82 00.02 - Asbestos Abatement - Intermediate Precautions
- 1.3 REFERENCES .1 American Iron and Steel Institute (AISI)
- .1 AISI 316L Stainless Steel.
- .2 American Society for Testing and Materials (ASTM)
- .1 ASTM B117, Standard Practice for Operating Salt Spray (FOG) Apparatus.
 - .2 ASTM D635, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
 - .3 ASTM D2843, Standard Test Method for Density of Smoke from the Burning or Decompositions of Plastics.
 - .4 ASTM3222, Standard Specification for Unmodified Poly (Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
 - .5 ASTM D4101, Standard Specification for Polypropylene Injection and Extrusion Materials.
 - .6 ASTM E-84, Standard Test for Surface Burning Characteristics of Building Materials.

- .7 ASTM F1412, Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems.
- .8 ASTM F1673, Standard Specification for Polyvinylidene Fluoride (PVDF) Corrosion Waste Drainage System.
- .3 Canadian Standards Association (CSA)
 - .1 CSA-B181.3, Polyolefin Laboratory Drainage System.
- .4 Underwriters Laboratories (UL):
 - .1 UL 94, Test for Flammability of Plastic Materials for Parts in Devices and Appliances.
 - .2 UL 723, Test for Surface Burning Characteristics of Building Materials.
- 1.4 DELIVERY STORAGE AND DISPOSAL
 - .1 Waste Management and Disposal:
 - .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Collect and separate for disposal, paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

PART 2 PRODUCTS

- 2.1 CORROSION RESISTANT
 - .1 General:
 - .1 All corrosion resistant piping, as indicated on drawings, shall discharge into a non-corrosive, acid-resistant waste system. All drainage and vent piping in this system to be constructed of corrosion-resistant materials described herein.
 - .2 All drains of this system to be collected and discharged into the existing glass chemical piping and dilution tank system.
 - .2 Above floor piping except in horizontal service spaces i.e. plenums):

- .1 All drainage pipe run above ground including traps, waste and branch vents to be Schedule 40 blue-line polypropylene drainage pipe. The system to include all straight lengths, fittings and traps, couplings and hanger supports as well as adapters to connect to the tail pieces of sinks.
- .2 All piping to be installed free of strain. Horizontal runs to be supported by hangers spaced at 1.2 m centres. Vertical risers to be supported at floor by riser clamps to prevent lateral and downward movement.
- .3 All corrosion resistant drainage piping to be joined utilizing compression joints for piping up to and include NPS 2 and mechanical joints for piping NPS 3 and above. Joints to be fabricated from material similar to that utilized in pipe. The outer band of mechanical joints to be 300 series stainless steel, with bolt, nuts and washers plated to meet 100 hour salt spray test as per ASTM B117.
- .4 All flame retardant polypropylene (polypropylene) piping wall and floor penetrations through fire separations to be provided with ULC (Underwriters Listed for Canada) rated fire stop assemblies to provide a minimum 1 hour fire stop.
- .5 Fill openings between wall and/or floor and piping at penetrations through fire separations, with annular space greater than 6 mm with high density rock wool insulation. Provide sufficient void space to seal with fire stop sealant.
- .6 Provide fire stop sealant between wall and/or floor and pipe at penetrations through fire separations with annular space less than 6 mm.
- .7 Provide fire stop collars at either side of fire separation wall penetrations and one side only for fire separation floor penetrations. Secure collars in place with fastening hooks secured with either toggle bolts (gyproc) or anchors (concrete).
- .8 Supply and install 18 gauge metal pan enclosure around pipe openings in

concrete floors on metal deck.

- .3 Above floor piping in horizontal service spaces (i.e. plenums):
 - .1 All drainage pipe run above ground in horizontal service spaces including traps, waste and branch vents to be Schedule 40, PVDF polyvinylidene fluoride. The system to include all straight lengths, fittings and traps, couplings and hanger supports.
 - .2 All piping to be installed free of strain. Horizontal pipes to be supported by hangers spaced at 1.2 m centres. Vertical risers to be supported at floor by riser clamps to prevent lateral and downward movement.
 - .3 All corrosion resistant drainage piping to be joined utilizing compression joints for piping up to and include NPS 2 and mechanical points for piping NPS 3 and above. Joints to be fabricated from material similar to that utilized in pipe. The outer band of mechanical joints to be 300 series stainless steel, with bolt, nuts and washers plated to meet 100 hour salt spray test as per ASTM B117.
 - .4 All PVDF corrosion resistant pipe shall meet 25 flame spread, 50 smoke developed and be UL rated 94-V-0.
 - .5 All PVDF piping wall and floor penetrations to be provided with ULC (Underwriters Laboratories for Canada) rated fire stop assemblies to provide a minimum 1 hour fire stop.
 - .6 Fill openings between wall and/or floor and piping at penetrations through fire separations with annular space greater than 6 mm with high density rock wool insulation. Provide sufficient void space to seal with fire stop sealant.
 - .7 Provide fire stop sealant between wall and/or floor and pipe at penetrations through fire separations with annular space less than 6 mm.
 - .8 Provide fire stop collars at either side of fire separation wall penetrations and one side only for fire separation floor penetrations. Secure collars in place with fastening hooks secured with either

toggle bolts (gyproc) or anchors
(concrete).

- .9 Supply and install 18 gauge metal pan enclosure around pipe openings in concrete floors on metal deck.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install in accordance with Canadian Plumbing Code and local authority having jurisdiction and by certified journeyperson.
- .2 Install above ground piping parallel and close to walls and ceilings to conserve headroom and space, and to grade as indicated.
- .3 New acid resistant DWV for new plumbing fixtures to connect to existing glass chemical piping system.
- .4 Provide fire stopping at drainage piping wall and floor penetrations through fire separations.

PART 1 - GENERAL

1.1 GENERAL

- .1 This section covers items common to all sections of Divisions 02, 26, 27.

1.2 ELECTRICAL
WORK INCLUDED

- .1 The specification complements the drawings in describing the supply and installation of a complete electrical system. This system shall include but not necessarily be limited to the following:
- .1 A power distribution system including 120/208 volt 3 phase 4 wire panel boards,
 - .2 Small power system including wiring devices;
 - .3 Lighting system including luminaires, including wiring;
 - .4 Telephone and data system;
 - .5 Demolition of existing as noted.

1.3 CONTRACT DRAWINGS

- .1 The specification together with the drawings are intended to provide a description of a complete electrical system and therefore there shall be no omission of the items necessary or required to make a finished, workmanlike, first class installation, even though each and every item of labour and material may not be mentioned in the specification or shown on the drawings.
- .2 Items indicated on floor plans and not on riser diagrams, or vice versa, shall be considered fully covered by both.
- .3 Runs of conduit and outlet locations indicated on the drawings are diagrammatic and exact locations must be determined by this contract as the work proceeds, with due regard to the structure and the work of other trades. This contract shall make any changes dictated by structural requirements, or conflicts with other trades, without charge.
- .4 Apparent errors or omissions shall be referred to the Architect/Engineer whose decision shall be final.
- .5 Building dimensions shall not be scaled from the electrical drawings but shall be obtained from the architectural and/or structural drawings. Any

discrepancy between the drawings and building shall be questioned before proceeding with the installation.

1.4 CODES AND STANDARDS

- .1 As a minimum standard perform all work in accordance with the requirements of the Provincial Department of Labour, Canadian Electrical Code C22.1-2012 Part 1, CSA Standards CAN Z32.4 and CAN Z32.2, National Building Code, and ULC-S524-2010. These standards together with all local or municipal rules, regulations, and ordinances shall be considered as the latest approved editions at the time of tender closing. In no instance, shall the standard established in these contract documents, be reduced by any codes.
- .2 Abbreviations for electrical terms: to CSA Z85-1983.
- .3 Comply with CAN/CSA C860-11 standard for exit signs.
- .4 Comply with efficiency values as indicated in the latest version of CSA C802.2 Minimum Efficiency Values for Dry Type Transformers. Transformers to bear label of verification agency logo near nameplate.
- .5 Comply with CSA Certification Standards and Electrical Bulletins in force at the time of tender submission.

1.5 INSPECTION, PERMITS AND FEES

- .1 Obtain all inspections and permits required by all laws, ordinances, rules and regulations by the public authority having jurisdiction at the place of this building for work of this Contract, and obtain certificates of such inspections and submit same and pay all charges in connection therewith. The final certificate of inspection shall be obtained before final payment for work shall be considered due.

1.6 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- .1 Submit shop drawings, product data and samples in accordance with Division 1. Provide all shop drawings within 30 days after contract has been awarded. Failure to do so will delay progress payments.

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- .2 Indicate details of construction, dimensions, capacities, weights and electrical performance characteristics of equipment or material.
 - .3 Where applicable, include wiring, single line and schematic diagrams.
 - .4 Include wiring drawings or diagrams showing interconnection with work of other Sections.
 - .5 Keep one copy of shop drawings and product data on site, available for reference at all times.
- 1.7 OPERATION AND MAINTENANCE DATA
- .1 Provide operation and maintenance data for incorporation into Operation and Maintenance Manuals as specified in Division 1.
 - .2 Include in the operation and maintenance data:
 - .1 Details of design elements, construction features, component function, and maintenance requirements to permit effective start up, operation, maintenance, repair, modification, extension, and expansion of any portion or feature of installation.
 - .2 Technical data, product data, supplemented by bulletins, component illustrations, exploded views, technical description of items and parts lists. Advertising or sales literature not acceptable.
 - .3 Wiring and schematic diagrams and performance curves.
 - .4 Names and addresses of local suppliers for items included in maintenance manuals.
 - .5 Copy of reviewed shop drawings.
 - .6 Signed receipt for all spare parts.
 - .3 Approvals:
 - .1 Submit one draft of Operating and Maintenance Manual to Engineer for approval one month prior to estimated substantial completion date. Submission of individual data will not be accepted unless so directed by Engineer.
 - .2 Make any changes in submission as may be required and re-submit as directed.
 - .3 Failure to do so will result in delay of progress payment.
 - .4 Provide two (2) final bound copies of Operation and Maintenance Manuals to Owner

and one (1) bound copy to Engineer.

1.8 PROJECT
RECORD DOCUMENTS

- .1 Provide Project Record Documents in accordance with Division 1.
- .2 Submit record drawings to Architect/Engineer showing changes of wire sizes, circuit numbering and location of raceways, fittings, fixtures, panels and equipment, and their sizes, the location of which has changed or deviated during the work.
- .3 Submit sepia or reproducible of record drawings after record drawings have been approved by the Engineer. Originals shall be made available by the Engineer for the making of sepia or reproducible of the contract drawings. All changes reflected on record drawings are to be indicated on these sepia or reproducible.

1.9 MAINTENANCE
MATERIAL

- .1 Provide maintenance materials in accordance with Division 1.

1.10 CARE, OPERATION
AND START-UP

- .1 Instruct operating personnel in the operation, care and maintenance of the equipment.
- .2 Arrange and pay for services of the manufacturer's service engineer to supervise start-up and to check, adjust, balance and calibrate components.
- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

1.11 VOLTAGE RATINGS

- .1 Operating voltages to meet requirements of CAN3-C235.
- .2 Motors, control and distribution equipment to operate satisfactorily at 60 Hz within normal operating limits established by the above standard. Equipment to operate in extreme operating conditions established in the above standard without damage to the equipment.

1.12 MATERIAL AND
EQUIPMENT

- .1 Provide materials and equipment in accordance with Division 1.
- .2 Equipment and materials to be C.S.A. certified, and manufactured to standard quoted.
- .3 Where there is no alternative to supplying equipment which is not C.S.A. certified, obtain special approval from C.S.A.
- .4 Factory assemble control panels and component assemblies.
- .5 For the purposes of uniformity similar materials shall be of one manufacturer (i.e. all panels; all motor control equipment; all fixtures in as much as is possible, etc.).
- .6 To avoid the possibility of the work being delayed, order all materials as soon as the shop drawings are reviewed, and report at once to the Architect/Engineer any delays in the delivery of materials which would hold up the completion of the job.

1.13 GROUNDING

- .1 All equipment and exposed non-current carrying metal, conduits and parts shall be permanently and effectively *bonded to ground* to meet minimum requirements of the C.E.C. Section 10, and as indicated on the drawings and further specified. Standards set either by drawings or specifications which are above those covered by C.E.C. Section 10, shall not be reduced under any circumstances.

1.14 ELECTRIC MOTOR,
EQUIPMENT AND CONTROLS

- .1 Provide final connections to all motors, equipment, controls, etc., indicated on the drawings. These motors, equipment, controls, etc., shall include those supplied under other sections of this specification, as well as Owner supplied items. Ensure that equipment will operate properly (e.g. proper rotation) and report any instance of defective equipment to the Architect/Engineer.
- .2 Supplier and installer responsibility is

indicated on electrical drawings, and in this specification and related mechanical responsibility is indicated on mechanical drawings, and in the Division 15 specifications.

- .3 All electrical equipment, which is supplied and installed by this Contract or other contracts, that requires wiring at or above 50V, shall be wired by this Contract in accordance with terms and regulations established by this Specification.
- .4 All electrical wiring and connections below 50V related to systems specified under other sections or contracts shall be done by their contractor in accordance with terms and regulations established by this Specification.
- .5 All electrical wiring and connections below 50V related to systems specified by Division 26 shall be done by the Division 26 Contractor.

1.5 FINISHES

- .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.
- .2 Clean, prime and paint exposed hangers, racks, and fastenings to prevent rusting.
- .3 Where wire guards are specified in other sections, they are to be constructed of stainless steel. Painted steel is not acceptable.

1.16 EQUIPMENT IDENTIFICATION

- .1 All switchboards, motor control centres, starters, disconnect switches, receptacles, voice/data/CATV/multimedia outlets, dry-type transformers, control transformers, pushbuttons, timeclocks, panels, control panels, etc., shall have "Lamacoid" nameplates mounted on or adjacent for identification which shall include the panel designation, voltage, phase, wires overcurrent protection, H.P., KW and amperage as applicable. The nameplates shall be affixed to metal equipment with metal type pop rivets, and to all other equipment with contact type cement applied to the entire nameplate backing. Contact type cement shall be applied (battered) to complete rear side of plate, as opposed to several points or locations on same.

- .2 Install directories on the back of each door of panel boards, neatly arranged and mounted in frame under transparent cover. Directories shall be typed and shall show system voltage, which outlets are on each circuit and any special information, such as sizes of fuses, etc., necessary for the proper operation and maintenance of the system.
- .3 All sectionalizing panels shall have lamacoid plates affixed adjacent to each breaker.
- .4 Size of identification shall be suitable for equipment and importance of information.
- .5 All fused disconnect switches shall have lamacoid plates identifying the equipment they feed and a separate plate indicating maximum fuse size and type.
- .6 Lettering shall be of sufficient size to be readable from normal viewing distance and the information required on the nameplates shall dictate the physical size of plates.
- .7 Nameplates shall have white lettering on black background except for equipment connected to emergency power source, which shall have white lettering on red background.
- .8 All transformers to have lamacoid plates identifying source of primary feeder and secondary equipment which it feeds plus distribution designation lettering and/or numbers.
- .9 All "D" and "E" boxes 200mm x 200mm x 100mm or larger and "C" and "T" cabinets shall have lamacoid plates affixed indicating voltages and/or systems housed within.
- .10 Nameplates:
 - .1 Lamicoid 3mm thick plastic engraving sheet on metal surfaces, 1.5mm where not applied to metals.

NAMEPLATE SIZES

Size 1	10mm x 50mm	1 line	5mm high letters
Size 2	13mm x 75mm	1 line	6mm high letters
Size 3	16mm x 75mm	2 lines	5mm high letters
Size 4	19mm x 91mm	1 line	10mm high letters

Size 5	38mm x 91mm	2 lines	12mm high letters
Size 6	25mm x 100mm	1 line	12mm high letters
Size 7	25mm x 100mm	2 lines	6mm high letters
Size 8	50mm x 150mm	2 lines	12mm high letters

.11 Labels:

.1 Embossed plastic labels with 6.5mm high letters unless specified otherwise.

.12 Wording on nameplates and labels to be approved by the Engineer prior to manufacture.

.13 Allow for average of forty (40) letters per nameplate and label.

.14 Identification to be English.

1.17 WIRING IDENTIFICATION

.1 Conductor insulation shall be colour coded as follows:

Phase A	-	Red
Phase B	-	Black
Phase C	-	Blue
Neutral	-	White/Grey
Ground/Bond	-	Green
Isolated Ground	-	Green w/Yellow stripe

This shall apply to all phase conductors up to and including #2AWG and all sizes of neutral, bond and ground conductors up to and including #3/0AWG.

.2 For conductors exceeding sizes as described above, identification of wiring with approved coloured plastic tapes shall be acceptable. Attach to both ends of all conductor runs a minimum of 12" from terminations, and in all junction and/or pull boxes.

.3 Maintain phase sequence and colour coding throughout.

.4 Colour code shall be as per Section 26 05 21 2.1.1.

.5 Use color coded wires in branch circuit wiring, systems wiring and communication cables.

1.18 CONDUIT, CABLE AND JUNCTION/PULLBOX

.1 Identify all conduit fittings and junction/pull boxes along with their covers with colours as

IDENTIFICATION

described below. Boxes shall be coloured both inside and out where one colour is required, and inside only where two are required. Metal coverplates shall be completely painted where one colour is required, and shall have both colours applied diagonally where two colours are required. All junction boxes shall be colour identified prior to installation.

<u>.2</u>	<u>System</u>	<u>Colour</u>
	120/208V Lighting & Power	Yellow
	Grounding/bond	Green
	Fire Alarm	Red
	Security	Brown
	0 to 50V	Violet
	CATV	Yellow/White
	Data only	Black/White
	Voice & Data	Blue/White
	Energy Management	Red/White

1.19 WIRING
TERMINATION

.1 Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors as indicated.

1.20 MANUFACTURERS
AND CSA LABELS

.1 Manufacturers and CSA labels shall be visible and legible after equipment is installed.

1.21 WARNING SIGNS

.1 Provide warning signs, as specified and/or to meet the requirements of the Department of Labour Inspection Department.

.2 Use decal signs, minimum 175mm x 250mm size.

1.22 SINGLE LINE
DIAGRAMS

.1 Provide a framed single line diagram under Plexiglas as follows:

- .1 Fire Alarm System Riser;
- .2 Security System Riser;
- .3 Access Control System Riser;
- .4 Power distribution system riser;
- .5 Structured Cabling System Riser.

1.23 LOCATION
OF OUTLETS

.1 Locate outlets in accordance with Division 1.

.2 Do not install outlets back-to-back in wall; allow minimum 150mm horizontal clearance between boxes.

- .3 Change location of outlets at no extra cost or credit providing distance does not exceed 3 metres and information is given before installation.
- .4 Locate light switches on latch side of doors and safety switches in mechanical rooms on latch side of door where possible.
- .5 Coordinate on site the location of outlets with respect to counters, heating cabinets, etc., before work is to start.
- .6 All outlets to have brushed stainless steel coverplates regardless of the system involved, includes light switches, receptacles, communication outlets and etc.

1.24 MOUNTING HEIGHTS

- .1 Mounting heights of equipment is from finished floor to centre line of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not indicated verify before proceeding with installation.
- .3 Install electrical equipment at the following heights unless indicated otherwise.
 - .1 Local switches, to switch: 1200mm
 - .2 Wall receptacles:
 - .1General: 400mm
 - .2Above top of continuous baseboard heater:
 - .3Above top of counters or splash back:
 - .4In mechanical rooms: 1200mm
 - .3 Panelboards: as required by code or as indicated
 - .4 Data/Telephone outlets: 400mm
 - .5 Pay phone: 1500mm
 - .6 End of line resistor: 2100mm
 - .7 Motor starters, disconnect, etc.:
 - .8 Luminaires: as indicated on drawings
 - .9 Fire alarm pull stations: 1200mm
 - .10 Fire alarm bells: 2100mm
 - .11 Unit emergency lighting equipment:

1.25 PROTECTION

- .1 Protect exposed live equipment during construction for personnel safety.

- .2 Shield and mark live parts "LIVE 120 VOLTS" or with appropriate voltage in English.
- .3 Arrange for installation of temporary doors for rooms containing electrical distribution equipment. Keep these doors locked except when under direct supervision of electrician.

1.26 LOAD BALANCE

- .1 Balance all phase currents of transformers, main switchboard, distribution Panel boards, etc., and where applicable, adjust transformer taps to obtain within 2% of the rated voltage of the load being supplied. Make adjustments and/or increase conductor size so as to limit voltage drops to 3% and make such adjustments under average load conditions in presence of Engineer.
- .2 Submit to Engineer, at completion of work, a report listing the voltage, phase and neutral currents on the switchboard, Panel boards and dry-type transformers, operating under normal load. On the report also state hour and date on which each load was measured.

1.27 CONDUIT AND CABLE INSTALLATION

- .1 Install conduit, and sleeves, prior to pouring of concrete. Sleeves through concrete shall be constructed of sheet metal, sized for free passage of conduit, and protruding 50mm.
- .2 Install cables, conduits, and fittings to be embedded neatly and close to building structure so furring can be kept to minimum.

1.28 FIRESTOPPING AND SMOKE SEALS

- .1 All fire stopping and smoke seals required to properly accommodate the work of this Division shall be the financial responsibility of Division 26, and carried out by trades to the applicable ULC approved system of one of the approved Manufacturers provided in this document. Trades personnel must be trained by the manufacturer and provide documentation stating same.
- .2 Refer to architectural drawings for locations of assemblies and refer to Division 1 for firestopping details and procedures.

1.29 TESTS

- .1 Conduct and pay for tests of the following:

- .1 Power distribution system including phasing, voltage, grounding and load balancing.
 - .2 Circuits originating from branch distribution panels.
 - .3 Lighting and its controls.
 - .4 Motors and associated control equipment including sequenced operation of systems where applicable.
 - .5 Polarity check on receptacles.
 - .6 Structured cabling system.
 - .7 Fire Alarm system.
 - .8 Security System
 - .9 Emergency Lighting System
 - .10 Exit Signage
 - .11 Access Control System
-
- .2 Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturers' instructions.
 - .3 Carry out tests in presence of Architect and/or Engineer. Notify Architect and/or Engineer seven (7) days in advance of time testing will take place.
 - .4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
 - .5 The Architect and/or Engineer reserves the right to use any piece of electrical equipment, device, or material installed under this contract for such reasonable lengths of time and at such times as he may require in order to make a complete and thorough test of the same, before the final completion and acceptance of the work.
 - .6 Such tests shall not be construed as acceptance of any part of the work.
 - .7 Submit test results for Architect's and/or Engineer's review.
-
- 1.30 INSULATION RESISTANCE TESTING
 - .1 Test all wiring, included in the work to ensure that there are no shorts and/or grounds are present on phase conductors for feeders or branch circuits and that insulation values are as

required by the Canadian Electrical Code.

- .2 All testing of conductors to be done prior to energization of conductors with 600 volt and 1000 volt meggers as required by the Canadian Electrical Code.
- .3 Capacitive leakage testing of all phases and neutral feeder conductors at various system originating points, are to be recorded for each individual feeder with test results to be submitted to Architect and/or Engineer for approval.
- .4 Systems to be tested for capacitive leakage are as follows: 120/208V/3PH/4W.
- .5 Check resistance to ground before energizing. Ensure resistance to ground is not less than 50 megohms.
- .6 Submit test results for Architect's and/or Engineer's review. Test results shall include time of test, feeder tested, and instrument readings.

1.31 COORDINATION
OF PROTECTIVE
DEVICES

- .1 Ensure circuit protective devices such as over-current trips, relays, fuses, are installed to values and settings as indicated.

1.32 CLEANING

- .1 Do final cleaning in accordance with Division 1.
- .2 At time of final cleaning, clean lighting reflectors, lenses and other lighting surfaces that have been exposed to construction dust and dirt.
- .3 On completion of work, remove debris resulting from work of this Division and leave the site neat and tidy. Equipment shall be checked for proper fitting and alignment, adjusted, cleaned, repainted where necessary, and left in first class condition.
- .4 This section shall be responsible for the removal of spatters, droppings, soil, labels, and debris from finished surfaces and from surfaces to receive finishes, before the set up. Work and

adjacent finished work shall be left in new condition.

- .5 Only cleaning materials which are recommended for the purpose by both the manufacturer of the surface to be cleaned and of the cleaning material shall be used.
- .6 Immediately before and during finishing work shall be made "broom clean". Interior areas shall be "vacuum cleaned" immediately before finish painting commences.
- .7 Material at site cannot be burned or buried except where approved by Architect and/or Engineer. Removal shall be as often as required to avoid accumulation in order to ensure site is maintained clean.
- .8 Volatile fluid wastes cannot be disposed of in storm or sanitary sewers or in open drain courses.
- .9 Lowering of materials shall be controlled and shall not be dropped or thrown from stories above grade.

1.33 COORDINATION

- .1 Cooperate and investigate with other trades to make maximum use of the spaces. Avoid conflicts with pipes, ducts, etc. Prepare shop drawings indicating the route of main conduits and ducts for submission to the Architect and/or Engineer for approval.
- .2 Cooperate with other trades on the site and carry out the work, in such a way, as not to hinder or hold up the work of other trades.
- .3 Consult with other trades, where their respective installations conflict and re-route conduits, ducts, outlets, equipment, etc., as required, subject to the approval of the Architect and/or Engineer.
- .4 Obtain from the mechanical and other trades complete detailed wiring diagrams of equipment requiring connections and be responsible for pointing out any discrepancies or the reason why they cannot be adhered to.

- .5 Locate all light fixtures, speakers, smoke detectors, etc. using Architect's reflected ceiling plan as a guide.

1.34 SUPERVISION

- .1 Provide supervision and sufficiently qualified foreman for work of this Contract to ensure that the work proceeds in proper and efficient manner to its completion. If in the opinion of the Architect and or Engineer, such personnel are not competent to carry out the work, replace these men immediately upon written request of the Architect and/or Engineer.

1.35 COMMISSIONING
OF ELECTRICAL
SYSTEMS

- .1 Upon receipt of written verification from the Contractor that:
 - .1 All systems are complete and operational in all respects.
 - .2 All specified reports and documents have been submitted and approved.
 - .3 All demonstrations have been completed and documented, the Engineer will commence a systems' commissioning period.
- .2 During this period of not more than 20 working days, the Engineer will verify the operation of all systems. The commissioning process may involve real or simulated conditions to determine the systems full operational capabilities. Copies of all specified reports and documents are to be available on site during the commissioning period.
- .3 During the commissioning process, the on-site foreman of the electrical subtrade involved in the supervision of the work plus one electrician is to be on site providing full-time assistance to the Engineer. In addition, systems' suppliers' representatives are to be available to be on site providing full-time assistance to the Engineer within 48 hours' notice to assist in the verification of their respective systems.
- .4 All necessary equipment such as meters, load banks, et cetera required to fully commission the systems are to be made available to the Engineer.
- .5 Deficiencies or discrepancies discovered during the commissioning process are to be immediately

rectified. Exceptional arrangements for labour and materials will be required to correct deficiencies, which prevent the satisfactory completion of the commissioning process.

1.36 ELECTRICAL
ROOM LAYOUTS

- .1 Refer to drawings for layout of electrical rooms; these drawings indicate the suggested arrangement of equipment in the various electrical rooms, with the exception of the freestanding main switch, which shall be installed in the center of the room as shown. After ordering equipment, the Electrical Contractor should verify dimensions of equipment on shop drawings or equipment brochures and discuss the arrangement of his equipment in all electrical rooms before roughing in. If changes are to be made in the arrangement of equipment they should be noted on these drawings and submitted to the Architect and/or Engineer for approval and composite drawings should be prepared by the Contractor wherever major changes are necessary.

1.37 ACCESS DOORS

- .1 This section to supply access doors for furred ceilings or spaces for servicing equipment and accessories or for inspection of safety, operating or fire devices for installation under Contractor responsible for erecting walls or ceilings. Provide ULC rated doors in fire rated construction.
- .2 Access doors shall be flush mounted size 300 x 300mm for hand entry or 600 x 600mm for body entry as required. Doors shall open 180 degrees and have rounded safety corners, concealed hinges, screwdriver latches anchor straps and steel shall be prime coated.
- .3 Provide stainless steel access doors for tiled, marble or terrazzo surfaces or special surfaces.
- .4 Provide cam type locking devices with hand or key lock when located in public corridors and washrooms complete with master keys.
- .5 Acceptable Product: Zurn, Enpoco, Williams WB.

1.38 UTILITY SERVICES

- .1 Division 26 Contractor is financially responsible to provide complete electrical, telephone and computer systems as specified including all

necessary equipment and connections to the selected power Utility and telecommunication Utility infrastructures. Payment of permits and other charges as may be levied by the Utilities shall be included in tender price.

1.39 SPRAY FIRE
PROOFING

- .1 Spray fireproofing will be installed on the underside of roof deck, joists, beams and columns above the finished ceilings or on the open penthouse steel. This Contractor is to install all conduits, boxes, etc., as required prior to spray application. Any conduits, etc., installed after spray is applied will be the financial responsibility of Division 26 Contractor to have the fireproofing repaired where any damage may have occurred.

1.40 SPRINKLER
PROOF HOODS

- .1 All distribution equipment with ventilated enclosures (Switchboards, MCC's, transformers, panel boards, relay panels and etc.) located in the building shall be protected from the direct spray from sprinkler heads to the satisfaction of the Inspection Authority by the use of non-combustible hoods.
- .2 Distribution conduits entering or exiting the equipment enclosures equipped with sprinkler hoods shall be installed with rain tight EMT connectors equipped with O-rings.

PART 1 - GENERAL

1.1 REFERENCE STANDARDS .1 CSA C22.2 No. 18 - Clamps and connectors.

.2 CSA C22.2 No. 65 Wire Connectors.

1.2 RELATED WORK

.1 Not applicable.

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 Not applicable.

1.4 OPERATION AND MAINTENANCE DATA

.1 Not applicable.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 All connections shall be made electrically and mechanically secure. Sizes of connectors shall be according to manufacturer's recommendations for each size and combination of wires.

.2 Joints required in branch wiring #10 AWG and smaller shall be made using fixture twist-on type connectors with current carrying parts made of copper.

.1 Standard of Acceptance: Marrette #31, #33 or #35 as required.

.3 Joints for wiring #8 AWG and larger shall be made using pressure type colour keyed compression connectors with current carrying parts made of copper using compression tools. A first layer of tape shall be compound type followed by a layer of Scotch #3 vinyl type.

.1 Standard of Acceptance: 54000 series.

.4 Bushing stud connectors are not acceptable.

.5 Clamps or connectors for armoured cable and flexible conduit as required.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Remove insulation carefully from ends of conductors and:
 - .1 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2 No. 65.
 - .2 Install fixture type connectors and tighten with pliers or appropriate tool. Finger-tightening alone is not acceptable. Replace insulating cap.
- .2 All connections shall be made electrically and mechanically secure. Sizes of connectors shall be according to manufacturer's recommendations for each wire size and combination of wires. Twist wires together before installing connectors. All stranded conductors shall be twisted together prior to connection around terminal.

PART 1 - GENERAL

- 1.1 REFERENCE STANDARDS
- .1 CSA C22.2 No. 38 - Thermoset insulated Wires and Cables.
 - .2 CSA C22.2 No. 51 - Armoured cables.
 - .3 Wire and cable shall conform to the latest specification of the Canadian Standards Association (CSA), Electrical and Electronic Manufacturers Association of Canada (EEMAC), the Insulated Power Cable Engineers Association (IPCEA), and the American Society of Testing Materials (ASTM).
- 1.2 RELATED WORK
- .1 Not applicable.
- 1.3 SHOP DRAWINGS AND PRODUCT DATA
- .1 Submit product data in accordance with Division 1.
- 1.4 OPERATION AND MAINTENANCE DATA
- .1 Not applicable.

PART 2 - PRODUCTS

- 2.1 BUILDING WIRES
- .1 Conductors: Copper, soft drawn stranded, at least 98% conductivity for #12 AWG and larger. Insulation shall be chemically cross-linked thermosetting polyethylene rated 600 volts on all RW90 conductors and 1000 volts for RWU-90 for incoming service. Size as indicated on drawings and schedules. Conductor insulation shall be colour coded as follows:
 - Phase A - Red
 - Phase B - Black
 - Phase C - Blue
 - Neutral - White/Grey
 - Ground/Bond - Green
 - Isolated Ground - Green w/Yellow stripe
 - Isolated Power - as indicated hereinafter.

Where extra colours are required for three-way switches, etc., they shall be yellow.

Approved color coded tape is acceptable for color coding phase conductors #1 AWG and larger and for neutral and ground conductors #4/0 and larger.

Neutral conductors for feeders to branch panels feeding computerized equipment shall be sized at 200%.

2.2 CONTROL CABLES

- .1 600 V Type: 2 stranded copper conductors, 95% conductivity, full size AWG gauge, sizes as indicated with PVC insulation Type TW with shielding of magnetic tape wire braid over each pair of conductors and overall covering of thermoplastic jacket. Colour code shall be yellow.

2.3 ARMOURED CABLES

- .1 Conductors: insulated, copper, size as indicated.
- .2 Type: AC90.
- .3 Armour: interlocking type fabricated from aluminum strip.
- .4 Connectors: to manufacturer's recommendations.

2.4 SYSTEM WIRING

- .1 Wiring for auxiliary systems will be as indicated in specification or on drawings and/or as recommended by Manufacturer of the system.

2.5 MANUFACTURERS

- .1 Standard of Acceptance: Nexans or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION OF BUILDING WIRES

- .1 Install all building wiring as follows:
 - .1 In conduit systems in accordance with Section 26 05 34.

3.2 INSTALLATION OF CONTROL CABLES

- .1 Install control cables in EMT conduit complete with all associated steel connectors and

couplings where run on surfaces of walls or open ceilings. Conduits shall be extended to within 760mm of all devices associated with the piece of equipment which they control. Final connection shall be made using liquid-tight flexible metal conduit and associated liquid-tight connectors.

- .2 EMT type conduit wall-stub c/w flush installed device box shall be located in all partitions to accommodate wiring between the device and the accessible ceiling space.
- .3 EMT connectors complete with nylon insulated throat or threaded type bushing shall be installed on end of EMT stubs where they protrude through the wall above, and within finished accessible ceilings. CSA approved EMT plastic end cap bushings may also be used.
- .4 All EMT conduit stubs shall be bonded to ground as required by CEC.
- .5 Control cable shields, if applicable, shall be bonded to ground.

3.3 INSTALLATION OF ARMOURED CABLES

- .1 Group cables wherever possible.
- .2 Flexible type conduit c/w RW90 conductors sized as noted and/or flexible armoured cable AC90 (BX) complete with separate grounding conductor.
- .3 "Fixture drop" is defined as that portion of AC90 cable or flexible conduit being used to make the final connection between the accessible type junction or outlet box located in ceiling space and its respective luminaire.
- .4 Flexible type conduit c/w RW90 conductors sized as noted and/or flexible armoured cable AC90 (BX) complete with separate grounding conductor.
- .5 AC-90 cable or RW90 in flex is to be used for branch circuit wiring drops from ceiling junction boxes to light fixtures, receptacles and other equipment requiring power in the same room only unless otherwise noted on the drawings. AC 90 (BX) cable used for fixture drops with a minimum size of No. 12. Total length of any individual AC-90

cable or flex c/w RW90 not to exceed 4500mm in length unless specifically indicated otherwise.. The use of AC90 for home runs or wiring between rooms is not permitted.

- .6 All flex c/w RW90 or AC-90 cables used for fixture drops shall be secured within 300mm of the junction box.
- .7 Where application of AC-90 cables and/or other types of pliable cables are to be used, they shall be installed parallel or perpendicular to the building lines unless otherwise noted.
- .8 Support and securing of type AC-90 cables shall not be derived from either suspended ceiling support wires or directly laying atop of the ceiling grid system.
- .9 All AC-90 feeds shall originate from the sides of outlet boxes and not from the box cover. There shall not be more than 4 drop feeds permitted from any one box regardless of its size. Where 3 or more drop feeds extend from any one box, that box shall be sized no smaller than 119mm square.

3.4 INSTALLATION

- GENERAL

- .1 Where pulling wires and cables, the use of an approved lubricant only will be permitted. No wires or cables shall be pulled in conduits until such conduits are free from moisture and in no case shall wires be pulled until approval of the Architect and/or Engineer is obtained.
- .2 All stranded conductors prior to terminating under device bolts such as circuit breakers, light switches, receptacles, etc., to be twisted together to form a single conductor to ensure a reliable mechanical connection.
- .3 All branch circuits are to utilize conduit pathways for home runs to each room or area, including rooms in which the panel is located. Where the branch circuit has multiple splices and/or drop offs to multiple rooms, the use of AC90 for the drop off is permitted, however, the home run conduit shall be continued until the final room destination splice or drop off is reached.

- .4 "Labelling" of all branch circuit wiring including phase conductors, neutrals, grounding and/or bonding conductors to be done on both ends of all circuit wires plus in any junction and/or pull boxes located in between using "Panduit" write-on, self laminating labels Nos. PDL-1 and PDL-2 as required.
- .5 The following wiring methods are designed to enhance the ability to perform capacitive leakage tests:
 - .1 All circuit conductors are to be individually tie wrapped to their corresponding labelled neutral conductor in all panelboards, pullboxes and junction boxes. Enough slack conductor length should be left to enable the ability to clamp the ground detector around the individually tie-wrapped circuit conductor and its corresponding labelled neutral. This wiring method is to be neat and of good workmanship quality.
 - .2 The tie wrapping of the neutral with its respective phase conductors is to be made at the closest point of entry into panelboards, pullboxes and junction boxes.
 - .3 The main switchboard, CDP's, panelboards, MCC's etc, are to have their respective feeder phase and neutral conductors tie-wrapped together and enough slack conductor length to enable the ability to clamp the ground detector around each set of feeders. This wiring method is to be neat and of good workmanship quality.
 - .4 After all electrical wiring has been completed by the Electrical Sub-Contractor, he is to test the grounded electrical distribution system to ensure there are not ground shorts and capacitive leakage in the system.
 - .5 All feeders or branch circuits which do not have neutral conductors are to have their respective phase conductors tie-wrapped together in accordance to the methods described previously.
 - .6 Run all circuits so that the voltage drop in no case exceeds 3% of the line volts. The neutral wire, wherever it is run, shall be continuous with no fuses, switches, or

- breaks of any kind.
- .7 For 15 amp, 120 volt circuits the following table shall be used to determine the minimum conductor sizes required to compensate for voltage drop. In no case does this table allow a reduction in conductor size from that shown on the drawings or as specified elsewhere in the specifications.
 - .8 Find below the branch circuit maximum lengths (120 volt one way length from panelboard to load including vertical drops. Voltage drop shall not exceed 3% in any instance.
 - .1 From 0.3m to 24m #12 Wire
 - .2 From 24m to 37m #10 Wire
 - .3 From 37m to 55m #8 Wire
 - .9 Increased wire sizes where required shall not be decreased in size in any portion of length of run between panelboard and the wiring device itself.
 - .10 All wiring shall be color coded as per Code requirements and/or as specified herein.

PART 1 - GENERAL

- 1.1 REFERENCE STANDARDS .1 Not Applicable.
- 1.2 RELATED WORK .1 Common Work Results Electrical: Section 26 05 00
- 1.3 SHOP DRAWINGS AND PRODUCT DATA .1 Submit shop drawings and product data in accordance with Division 1.
- 1.4 OPERATION AND MAINTENANCE DATA .1 Not applicable.

PART 2 - PRODUCTS

- 2.1 SUPPORT DEVICES .1 U shape, size 41mm x 41mm, 2.5mm thick, surface mounted or suspended as required.
- .2 Supply and install all necessary inserts, rods, channels, brackets, etc., to form a support system capable of carrying at least twice the weight of the equipment supported.
- .3 In concrete, use cast-in threaded inserts wherever possible. Should additional inserts be required use a "red head" type of insert capable of carrying at least 45 kgs.
- .4 All hanger rods shall be 10mm diameter continuous threaded rod cut to required lengths. Cut off excess to within 13mm of bottom of channel.
- .5 All conduits not installed on Unistrut or approved equal type support channels to be supported as follows:
.1 13mm up to and including 35mm conduits - one hole steel straps.
.2 41mm and larger sizes - two hole steel straps.
- .6 All suspended conduit runs containing horizontal or vertical elbows shall have one additional support rod installed at not more than 300mm from midpoint of all 90 degree bends.

- .7 Beam clamps to secure conduit to exposed steel work.
- .8 In no case will the use of tye-wraps for supporting purposes be acceptable unless explicitly approved for the purpose, such as for securing wiring in-place.
- .8 All trays, wireways, and multiple conduits, shall be supported by a steel channel support system with all components, hangers, wall supports, cable clamps, etc., specifically manufactured and approved for their application.
- .9 Fastening devices for cabinets, boxes, supports, etc., shall be nut and bolt, ramset, expansion shields, wedge anchors, or toggle bolts, size and number to suit the application or as detailed on the drawings. Toggle bolts shall not be used in gypsum wallboard construction.
- .10 Fastening devices for outlet boxes shall be nut and bolt, ramset, expansion shields, wedge anchors or caddy clips, size and number to suit the application or as detailed on the drawings.
- .11 Suspended outlet, pull and junction boxes shall be supported with minimum 10mm threaded rod, nuts and flat washers. Threaded rods shall be secured to boxes with one flat washer and nut installed on both sides of box. Threaded rods shall be installed as follows:
 - .1 One rod required for all types of boxes sized 150mmx150mm and smaller;
 - .2 Two rods required for all types of boxes sized larger than 150mmx150mm up to and including 300mmx300mm;
 - .3 Minimum of four rods required for all boxes larger than 300mmx300mm.

2.2 MANUFACTURERS

- .1 Standard of Acceptance: Burndy.
- .2 Other approved manufacturers: Erico, Electrovert, Pursley, Unistrut.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Secure equipment to hollow or solid masonry tile and plaster surfaces with lead anchors.
- .2 Secure equipment to poured concrete with expandable inserts.
- .3 Secure equipment to hollow masonry wall, or suspended ceilings with toggle bolts.
- .4 Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T-bars are adequately supported to carry weight of equipment specified before installation.
- .5 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
- .6 Suspended support systems.
 - .1 Support individual cable or conduit runs with 10mm dia threaded rods and spring clips.
 - .2 Support 2 or more cables or conduits on channels supported by 10mm dia threaded rod hangers where direct fastening to building construction is impractical.
- .7 For surface mounting of two or more conduits use channels at 1.5m on center spacing.
- .8 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .9 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .10 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .11 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Engineer.

- .12 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.
- .13 Coordinate the location of any insert to miss concrete reinforcement and obtain approval of Architect and/or Engineer prior to installing.
- .14 Secure all equipment in a manner so as not to distort or cause undue stress on any components.
- .15 Support of any equipment shall not rely on the strength of plaster or gypsum board construction.

PART 1 - GENERAL

- 1.1 REFERENCE STANDARDS .1 CSA C22.2 No. 18 - Outlet boxes, conduit boxes and fittings.
- 1.2 RELATED WORK .1 Not applicable.
- 1.3 SHOP DRAWINGS AND PRODUCT DATA .1 Not applicable.
- 1.4 OPERATION AND MAINTENANCE DATA .1 Not applicable.

PART 2 - PRODUCTS

- 2.1 OUTLET AND CONDUIT BOXES - GENERAL
- .1 Size boxes in accordance with Canadian Electrical Code, Part 1.
- .2 100mm square or larger outlet boxes as required for special devices.
- .3 Gang boxes where wiring devices are grouped.
- .4 Blank cover plates for boxes without wiring devices.
- .5 Combination boxes with CSA approved barriers where outlets for more than one system are grouped.
- .6 Outlet boxes for concealed use in frame construction shall be sectional, galvanized, pressed steel; these shall be restricted for use with flexible conduit AC-90 cable (where indicated) or other pliable type cable. The installation of any type of rigid type conduit in sectional boxes is prohibited. Where wire fill dictates larger boxes for outlets, use suitably sized square boxes with raised, square, welded tile ring style extensions. Tile rings shall not be used in surface mounted installations. Plaster type rings are not acceptable.

- .7 All outlet boxes connected to AC90 cabling shall be specifically designed for the purpose. Dual rated boxes are not acceptable.
- .8 Where multiple flush boxes are installed grouped together in metal drywall partitions, they shall be supported between the studs with a box mounting bracket (Caddy RBS or SGB series).

2.2 SHEET STEEL OUTLET BOXES

- .1 Electro-galvanized steel single and multi-gang flush device boxes for flush installation, minimum size 75 x 50 x 63mm or as indicated with a minimum volume of 262,192 cu. Mm (similar to Iberville # BC-3104-LSSAX). 100mm (4 inch) square outlet boxes when more than one conduit enters one side, with extension and tile rings (square, welded type) as required. For use in masonry construction, style MB (S or D) shall be used.
- .2 100 mm square or octagonal outlet boxes for lighting fixtures.
- .3 100mm square outlet boxes with extension and plaster rings for flush mounting special devices in finished plaster or tile walls.

2.3 MASONRY BOXES

- .1 Electro-galvanized steel masonry boxes single and multi-gang for devices flush mounted in exposed block walls and where indicated.
- .2 Provide a 2-gang deep masonry outlet box for al multimedia outlets, c/w stainless steel cover plates. Minimum dimensions are as follows: 95mm X 96mm X89mm deep. Install Caddy RBS Type mounting bracket.

2.4 CONCRETE BOXES

- .1 Electro-galvanized sheet steel concrete boxes for flush mounting in concrete with matching extension and plaster rings as required.
- .2 Where wire fill dictates larger boxes than single gang outlets, use suitable sized square boxes, with raised "tile ring" style extension.

2.5 CONDUIT BOXES

- .1 Cast FS Aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacles.
- .2 Metal type "FS" device plates to be used on all type "FS" boxes unless noted otherwise.

2.6 RIGID
CONDUIT BOXES

- .1 Cast FS or FD ferrous rigid conduit boxes with factory-threaded hubs and mounting feet for surface wiring where rigid conduit other than "EMT" is used.

2.7 MULTI-OUTLET
BOXES

- .1 Electro-galvanized steel barrier pre-ganged multi-outlet boxes for devices with different sources of voltage in the same box.
- .2 The barrier of sheet steel shall not be less than (No. 16 MSG) thick used to divide the space into separate compartments for the conductors of each system. The barrier shall be fastened rigidly to the box.

2.8 FITTINGS -
GENERAL

- .1 Bushing and connectors with nylon insulated throats.
- .2 Knock-out fillers to prevent entry of foreign materials.
- .3 Conduit outlet bodies for conduit up to 32mm and pull boxes for larger conduits.
- .4 Double locknuts and insulated bushings on sheet metal boxes.

2.9 CONDUIT
SUPPORTS

- .1 In steel stud framing construction provide for boxes a metal stud clip (Caddy MSF) and a far side support (Caddy 766) or a separate quick mount support (Caddy "H" Series).
- .2 Use adjustable screws gun brackets (caddy "TS" series) where box requires mounting between steel studs.

- .3 Other support systems will be accepted only after review by Engineer.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Support boxes independently of connecting conduits.
- .2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of construction material. Remove filling material at completion of project.
- .3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 65mm of opening.
- .4 Provide correct size of openings in boxes for conduit and armoured cable connections. Reducing washers not allowed.
- .5 At each local switch, receptacle, ceiling or wall fixture, continuous row of fixtures, or system unit (i.e. fire alarm, T.V., etc.) provide and install a standard or twin filler or barrier pressed steel outlet box, unless specifically noted otherwise. All outlet boxes shall be fabricated of galvanized sheet steel and set flush with finished surfaces. They shall be rigidly and securely set.
- .6 All flexible conduit fixture feeds shall originate from the side of the outlet box and not from the box cover, with the exception of the modular furniture connections, which shall be permitted to exit from the cover.
- .7 In locating outlets, take care to allow for radiation, pipes, ducts, etc., and for the variation in arrangement and thickness of finishes, etc. Failure to comply with this will not relieve Electrical Contractor from the cost of necessary alterations.
- .8 Allow for the relocation of an outlet up to a dimension of 3m from that indicated on drawings, provided notice is given before roughing-in has been completed.

- .9 Install floor boxes in concrete formwork, prior to concrete pour, securely set to ensure finished collar is flush with the surface of the specified finish flooring.

PART 1 - GENERAL

1.1 REFERENCE
STANDARDS

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA C22.2 No. 18, Outlet Boxes, Conduit Boxes, and Fittings and Associated Hardware.
 - .2 CSA C22.2 No. 45, Rigid Metal Conduit.
 - .3 CSA C22.2 No. 56, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
 - .4 CSA C22.2 No. 83, Electrical Metallic Tubing.
 - .5 CSA C22.2 No. 211, Rigid PVC (Unplasticized) Conduit.
 - .6 CAN/CSA C22.2 No 227, Flexible Nonmetallic Tubing.

1.2 WASTE MANAGE-
MENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with local requirements.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

PART 2 - PRODUCTS

2.1 CONDUITS

- .1 Thin wall type electrical metallic tubing "EMT" with steel set screw couplings, galvanized, size as indicated.

2.2 EXPANSION
FITTINGS FOR
RIGID CONDUITS

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection in all directions.
- .3 Weatherproof expansion fittings for linear expansion at entry to panel.

- 2.3 FISHCORD .1 6.5 mm standard nylon pull rope with tensile strength of 5 kN.

PART 3 - EXECUTION

- 3.1 INSTALLATION
- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
 - .2 Conceal conduits except in mechanical and electrical service rooms and in unfinished areas.
 - .3 Use epoxy coated conduit in underground or in corrosive areas.
 - .4 Use electrical metallic tubing (EMT) except in cast concrete and above 2.4 m not subject to mechanical injury.
 - .5 Use rain-tight connectors and couplings where vertical portion of EMT conduit runs terminate into the top of electrical equipment incorporating drip shields or hoods.
 - .6 Use rigid PVC conduit underground and in corrosive areas. Thin-wall (DB2) rigid PVC shall be permitted only where encased in concrete.
 - .7 Use flexible metal conduit for connection to recessed incandescent fixtures without a prewired outlet box, connection to surface or recessed fluorescent fixtures and work in movable metal partitions.
 - .8 Use liquid tight flexible metal conduit (minimum 3/8" internal diameter) for connection to motors or vibrating equipment in all locations, including controls and related devices
 - .9 Use explosion proof flexible connection for connection to explosion proof motors.
 - .10 Install conduit sealing fittings in hazardous areas. Fill with compound.

- .11 Minimum conduit size for lighting and power circuits: 19 mm.
 - .12 Install EMT conduit from branch circuit panel to outlet boxes located in sub floor.
 - .13 Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter.
 - .14 Mechanically bend steel conduit over 19 mm diameter.
 - .15 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
 - .16 Install fish cord in empty conduits.
 - .17 Run 2 - 25 mm spare conduits up to ceiling space and 2 - 25 mm spare conduits down to ceiling space from each flush panel. Terminate these conduits in 152 x 152 x 102 mm junction boxes in ceiling space or in the case of an exposed concrete slab, terminate each conduit in surface type box.
 - .18 Remove and replace blocked conduit sections. Do not use liquids to clean out conduits.
 - .19 Dry conduits out before installing wire.
 - .20 Use electrical metallic tubing (EMT) for the following:
 - .1 Communication outlets between the device box and accessible ceiling space in all wall and partitions;
 - .2 All Fire alarm system wiring;
 - .3 All security system wiring;
 - .4 All wiring within electrical rooms and mechanical rooms;
 - .5 All panel feeders;
 - .6 Structured wiring for system copper backbone cable;
 - .7 All fiber;
 - .8 Home runs to panel boards from all branch circuit wiring;
 - .9 Where noted elsewhere.
- 3.2 SURFACE
- .1 Run parallel or perpendicular to building lines.

CONDUITS

- .2 Locate conduits behind infrared or gas fired heaters with minimum 1.5 m clearance.
- .3 Run conduits in flanged portion of structural steel.
- .4 Group conduits wherever possible on surface channels.
- .5 Do not pass conduits through structural members except as indicated.
- .6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

3.3 CONCEALED
CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Do not install horizontal runs in masonry walls.
- .3 Do not install conduits in terrazzo or concrete toppings.

3.4 CONDUITS IN
CAST-IN-PLACE
CONCRETE

- .1 Locate to suit reinforcing steel. Install in centre one third of slab.
- .2 Protect conduits from damage where they stub out of concrete.
- .3 Install sleeves where conduits pass through slab or wall.
- .4 Provide oversized sleeve for conduits passing through waterproof membrane, before membrane is installed. Use cold mastic between sleeve and conduit.
- .5 Do not place conduits in slabs in which slab thickness is less than 4 times conduit diameter.
- .6 Encase conduits completely in concrete with minimum 25 mm concrete cover.
- .7 Organize conduits in slab to minimize cross-overs.

3.5 CONDUITS IN
CAST-IN-PLACE
SLABS ON GRADE

- .1 Run conduits 25 mm and larger below slab and encased in 75 mm concrete envelope. Provide 50 mm of sand over concrete envelope below floor slab.
- .2 Transitions from rigid PVC conduit to rigid steel threaded conduit shall take place below floor slab.
- .3 Transitions from rigid steel threaded conduit to EMT conduit shall take place above concrete floor slab.

3.6 CONDUITS
UNDERGROUND

- .1 Slope conduits to provide drainage.
- .2 Waterproof joints (PVC accepted) with heavy coat of bituminous paint.

PART 1 - GENERAL

- 1.1 REFERENCE STANDARDS
- .1 CSA C22.2 No. 111 - General Use Switches.
 - .2 CSA C22.2 No. 42 - General Use Receptacles, Attachment Plugs and Similar Wiring Devices.

- 1.2 RELATED WORK
- .1 Not applicable.

- 1.3 SHOP DRAWINGS AND PRODUCT DATA
- .1 Submit shop drawings and product data in accordance with Division 1.

- 1.4 OPERATION AND MAINTENANCE DATA
- .1 Not applicable.

PART 2 - PRODUCTS

- 2.1 SWITCHES
- .1 Switches as specified on drawings.
 - .2 All switches shall be from one manufacturer throughout, specification grade, ivory in colour.

- 2.2 RECEPTACLES
- .1 Unless specified otherwise, all receptacles are duplex type.
 - .2 All receptacles shall be from one manufacturer throughout, CSA Type, commercial specification grade and suitable for back wiring of #10AWG conductors. Complete with ivory coloured nylon face.
 - .3 5-15R receptacles: Hubbell BR15WH or approved equal by Leviton (BR15-W), Cooper (BR15W).
 - .4 5-20R receptacles: Hubbell BR20WH or approved equal by Leviton (BR20-W), Cooper (BR20W).

- 2.3 EXTERIOR RECEPTACLES
- .1 Not Applicable.

- 2.4 COVERPLATES
- .1 Stainless steel, vertically brushed, 1mm thick for wiring devices mounted in flush mount boxes.

Hubbell SS8 or approved equal by Leviton, Cooper.

- .2 Cover plates from one manufacturer throughout project and required for all devices.
- .3 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.
- .4 Cast cover plates for wiring devices mounted in surface-mounted outlet boxes.
- .5 Weatherproof cover plates *shall be heavy cast aluminium 'WHILE IN USE', lockable, complete with enclosure keys.*

2.5 INDUSTRIAL
DUTY CABLE REEL

- .1 Not Applicable.

2.6 MANUFACTURERS

- .1 Standard of Acceptance: Hubbell, Leviton, Cooper.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Switches:
 - .1 Mount toggle switches at height specified in Section 26 05 00 or as indicated.
 - .2 All switches and their wall plates shall be installed plumb, with switch handle in the "up" position when switch is closed.
 - .3 Group switches under one wall plate in gang type box where more than one switch is shown at one location and when more than three are grouped.
 - .4 Where light switches, thermostats, receptacles, etc., are located in close proximity with one another, they are to be located on the same vertical centerline at their respective heights.
- .2 Receptacles:
 - .1 Mount receptacles at height specified in Section 26 05 00 or as indicated. 120V 15A receptacle shall have their U-ground connection oriented to the upper or top side. Horizontally mounted 120V receptacles shall be installed with their neutral

- termination bolts located on the top side.
- .2 Install a green insulated ground conductor, between the grounding terminal of the receptacle and the grounding screw and stud of the outlet box. Minimum size of ground and/or bonding cables are to be #12 AWG.
 - .3 Group receptacles under one wall plate in gang type box, where more than one outlet is shown at one location, except if on separate circuits. The use of sectional boxes whether single or multi-ganged shall be restricted for use with flexible conduits, cables or other types of pliable cables.
 - .4 Two or more receptacles in same location but on different circuits shall be grouped under one wall plate but in separate boxes wherever possible. If not possible, they shall be kept separate but in close proximity to each other.
 - .5 Receptacles above counters shall be installed above the splashback to a height as indicated on the drawings and coordinated on the site.
 - .6 Receptacles installed on raceways to be fitted with raceway cut outs and fittings.
 - .7 "Pig-tail" type leads shall be installed on conductors in all device or outlet boxes where feeding through to other receptacles. "Daisy-chaining" of receptacles is not acceptable. Provide separate pig-tail conductor leads for final termination to each receptacle for phase, neutral and bond conductors.
- .3 Coverplates:
- .1 Coverplates to be installed plumb and have stainless steel screws.
 - .2 Install suitable common cover plates where wiring devices are grouped.
 - .3 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

PART 1 - GENERAL

1.1 REFERENCE
STANDARDS

- .1 CSA C22.2 No. 9-1968 - General Requirements for Luminaires.
- .2 CSA C22.2 No. 43-1965 - Socket screw-shell lampholders.
- .3 CSA C22.2 No. 74 - Discharge lampholders.
- .4 CSA C22.2 No. 84 - Incandescent lamps.
- .5 CSA C22.2 No. 84-1974 - Tungsten halogen lamps.
- .6 ANSI C78 series - Fluorescent lamps.
- .7 CSA C22.2 No. 74 - Ballasts. Equipment for use with Electric Discharge Lamps.
- .8 CSA C22.2 No. 8 - Radio interference suppressor. Electromagnetic Interference (EMI) Fitters.
- .9 CSA C22.2 No. 250.13-12 - Light emitting diode (LED) equipment for lighting applications.

1.2 RELATED WORK

- .1 Common Work Results Electrical: Section 26 05 00

1.3 SHOP DRAWINGS
AND PRODUCT DATA

- .1 Submit shop drawings and product data in accordance with Division 1.
- .2 Submit complete photometric data prepared by independent testing laboratory for luminaries where specified or requested for approval by Engineer.
- .3 Submit shop drawings on all lamps, dimming & electronic ballasts.

1.4 OPERATION AND
MAINTENANCE DATA

- .1 Not applicable.

1.5 GUARANTEE

- .1 Replace:
 - .1 Incandescent burning out within 3 months of takeover.
 - .2 Fluorescent and HID lamps burning out within 12 months of takeover.
 - .3 Ballasts that fail or exceed their original noise level rating within 12 months of takeover.
 - .4 LED drivers that fail within 12 months of takeover.

PART 2 - PRODUCTS

2.1 LUMINAIRE DETAILS

- .1 Provide fixtures as indicated in Paragraph 2.3 below and as shown on drawings.
- .2 Provide supporting devices, surface mounted junction boxes and outlet boxes where required.
- .3 Stamped steel Laminar bodies not to be less than 1 mm thick cold rolled steel. Reflective steel plates of minimum 0.8 mm thick metal.
- .4 Lenses or diffusers shall be of glass or acrylic material, as indicated.
- .5 Include finishes to Section 26 05 00 and as indicated.
- .6 Provide gasketing, stops and barriers to form light traps to prevent light leaks.

2.2 LAMPS

- .1 On completion of the project, provide a full set of best quality lamps for all lighting fixtures. Lamps shall be new and of a type suitable for the fixtures in which they are installed. Wherever possible, lamp type shall match that of ballast (e.g. lamp optimized for Programmed Start in a luminaire with Programmed Start ballast, etc.).
- .2 Generally fluorescent lamps shall be TCLP compliant to a level of 0.1mg/litre for mercury, T8, 32 or 17 watt (as indicated), initial lumen output of 2600(32W)/1300(17W), CRI of 86 minimum, 3500K and minimum 24,000 hour rated life. (Philips Alto F32T8/F17T8 or GE F32T8/F17T8/SP35/ECO)

- .3 Provide spare lamps in the quantity of 10% or 2 of each type, whichever is greater.

2.3 LUMINAIRE
MANUFACTURERS

- .1 Supply luminaires as described on the drawings and specified in the light fixture legend.

2.4 BALLASTS AND
ACCESSORIES

- .1 Fluorescent ballasts unless otherwise indicated shall be supplied with voltages matching the supply voltage indicated in the Fixture Schedule, and output current and voltage ratings of the lamp or lamps they are designed to operate. All ballasts shall be electronic type ballasts with high power factor (99%+) and minimum 0.88 ballast factor, instant starting type, less than 20% harmonics. All ballasts shall meet the requirements of the Certified Ballast Manufacturing Association.
Standard of Acceptance: Universal.

2.5 LUMINAIRE
SUPPORTS

- .1 Provide supports for suspended fixtures as recommended by manufacturer
- .2 Additional T-Bar grid supports that may be required for light fixtures installed in, or secured to, T-Bar type ceilings, shall be identified accordingly to the applicable ceiling contractor, who in turn will be responsible for supplying and installing additional hangers as may be required.
- .3 The installation of any additional T-Bar grid ceiling support wires is the sole responsibility of the ceiling installation contractor.
- .4 Independent supporting of light fixtures in T-Bar grid ceilings utilizing materials other than tie-wires, i.e. threaded rods, metal channels, etc., are the sole responsibility of the electrical contractor.

2.6 ACCEPTABLE
MANUFACTURERS

- .1 Equivalent acceptable as specified on drawings.
- .2 Approved equals shall be submitted to engineer

prior to tender closing in accordance with Division 1 to be reviewed as an equivalent to that specified.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 This work shall include the supplying and installation and connection of all lighting units and allied equipment as specified hereinafter and on the drawings as well as the receiving, storing and testing of same.
- .2 Locate fixtures as indicated on drawings.
- .3 Catalogue references numbers given for individual fixtures may not necessarily be correct but are intended as a guide when read with the description and may not agree with the type of fixture finally supplied; therefore the catalogue reference shall be verified with the description and co-ordinated with the installation conditions with particular regard to ceiling construction details, type and finish before ordering the fixtures.
- .4 Recessed fixtures shall have trim and frame details to match the ceiling suspension system and the Electrical Contractor shall co-ordinate with ceiling contractor.

3.2 WIRING

- .1 Connect fixtures to lighting circuits as indicated.
- .2 Recessed, surface and/or suspended fixtures shall not be wired in a daisy-chain manner, nor have their power sources looped between fixtures unless they are installed end-to-end.
- .3 Each luminaire shall be complete with its own separate fixture drop originating from a junction box located within the same ceiling space as the luminaire. An exception shall be made for recessed downlights, which may be wired from one fixture to another, provided they have integral junction boxes and the luminaire access opening is 150mm or greater in diameter.

-
- 3.3 LAMPS .1 Adjust lamp light to centre position to produce optimum beam distribution for fixtures.
- 3.4 RECESSED DOWNLIGHTS .1 Not Applicable.
- 3.5 FIXTURE ALIGNMENT .1 Align fixtures mounted in continuous rows to form straight uninterrupted line.
.2 Align luminaries mounted individually parallel or perpendicular to building grid lines.
- 3.6 FIXTURE SUPPORTS .1 Provide luminaire supports required to mount fixtures as specified.
.2 Hang all light fixtures in such a manner that their attachment to the ceiling shall be secure in all respects.
.3 Fixtures shall not be hung directly from suspended gypsum board ceilings, but shall derive their support from channels independently mounted in the ceiling space.
.4 Generally wire hangers shall be used to adequately secure and support the fixtures; these shall be provided and installed under work of this Contract.
- 3.7 DEFECTIVE OR DAMAGED FIXTURES .1 Check fixtures and replace all defective lamps, ballasts and accessories on any fixtures that have been damaged or scratched during construction.
.2 Replace lamps that have burned out as per paragraph 1.5 of this section.
- 3.8 TESTS .1 Perform tests in accordance with Section 26 05 00.
- 3.9 BUILDING TAKEOVER .1 All fixtures shall be operable, undamaged, and as specified at the time of building takeover.
.2 All lamps shall be new and burning at the time of takeover. All fixtures shall be clean and like new condition, at the time of takeover.

**PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGRICULTURE AND AGRI-FOODS CANADA BUILDING 25
ATLANTIC COOL CROP CLIMATE RESEARCH FACILITY
MOUNT PEARL, NEWFOUNDLAND AND LABRADOR**

ASBESTOS MANAGEMENT PLAN

FINAL REPORT

Submitted to:

Public Works and Government Services Canada
Environmental Services
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23 February 2007

Ref. No. TF61076144



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1.0 INTRODUCTION

AMEC Earth and Environmental, a division of AMEC Americas Limited (AMEC) was retained by Public Works and Government Services Canada (PWGSC) on behalf of Agriculture and Agri-Foods Canada (AAFC) to conduct an asbestos containing material (ACM) Survey and develop an Asbestos Management Plan (AMP) for the Atlantic Cool Crop Climate Research Facility (Building 25) located in Mount Pearl, Newfoundland and Labrador (the "Site Building"). The Site Building is currently occupied by a functioning agricultural research facility. The AMP for the Site Building was developed based on the most stringent requirements of the following documents:

- The Newfoundland and Labrador Asbestos Abatement Regulation 111/98.
- Treasury Board of Canada Secretariat Hazardous Substances Directive-II, Section 2.9 as it relates to asbestos management.
- Public Works and Government Services Canada (PWGSC) Departmental Policy (DP:057) – *Asbestos Management*, dated March 12, 1997.

The requirements of the AMP are as follows:

- Minimize any future asbestos fibre release by controlling access to asbestos containing materials (ACMs) and prevent uncontrolled disturbance of ACMs by establishing safe work procedures for activities that may disturb ACMs in Site Building;
- Monitor the condition of ACMs. Given the changing nature of the building's environment, the condition of ACM's may change. By monitoring the condition of the material, AMP-trained facility staff can ensure that ACM's are well maintained;
- Respond quickly and effectively to changes in the condition of the ACM's and properly repair and contain any damaged ACM's that may be encountered in the future;
- Workers must be able to recognize an asbestos emergency and respond accordingly; and
- Applicable regulations must be followed until all ACMs are removed from the building.

This AMP has been developed to assist facility staff to safely perform their job function when working near ACMs. All facility staff, at a minimum, must read this AMP and be familiar with the following basic elements:

- Asbestos Containing Materials (ACM) Survey;
- Background Information on Asbestos;
- Types of Asbestos Operations;
- Roles and Responsibilities;
- Work Procedures/Workers Protection;
- Periodic Surveillance;
- Labeling;
- Training;
- Notification of cleaning staff and outside contractors who may perform work at the facility; and
- Record Keeping.

This AMP was prepared based on the results of an ACM Survey that was performed at the Site Building by AMEC in December 2006. The ACM Survey is provided in **Appendix 1**.

2.0 BACKGROUND INFORMATION ON ASBESTOS

A discussion on asbestos, the development of regulations, and the need for an AMP is provided in the following sections. This discussion is warranted in order to provide an understanding of what asbestos is, what the concerns over asbestos in the work place are, and why an AMP is required.

2.1 Asbestos Characteristics

Asbestos is a family of naturally occurring fibrous silicates from two mineralogical groups:

- Serpentes, which include chrysotile (white asbestos). These spiral fibres are pliable, curly and made up of tiny individual fibrils; and
- Amphiboles, which include amosite (brown asbestos), crocidolite (blue asbestos), and tremolite. Amosite and crocidolite fibres are straight and needle like, whereas tremolite fibres are short and stubby.

The qualities of asbestos that promoted its use in construction are as follows:

- Fire resistance;
- Tensile strength;
- Durability;
- Flexibility; and
- Resistance to heat, wear, corrosion.

Asbestos has many building applications that include:

- Effective insulator against heat, cold, electricity and noise;
- Used as sprayed insulation and fireproofing materials in the period following the Second World War until about 1973;
- Used as a thermal insulator in pipes, boilers and incandescent light reflectors;
- Structural steelwork fireproofing of high-rise buildings;
- Acoustical and decorative purposes in ceiling tiles and building walls; and
- Durability in floor tiles, wall board, roof shingles and felts, gaskets, caulking, wall and ceiling plasters.

2.2 Potential Health Hazards

Asbestos is a health hazard only if it can enter into the body through:

- Inhalation;
- Ingestion; or

- Absorption.

The primary health-related concern of the above list is asbestos inhalation. Respiratory diseases such as asbestosis (lung scarring) and cancers have been clinically linked to prolonged and heavy occupational exposure to airborne asbestos.

Health-related concerns prompted the Ontario Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario (1981) to study and report on the health effects of asbestos in buildings in the early 1980's. The following is the conclusion of the Royal Commission report (Chapter 9) with bolding added to emphasize critical points:

“The exposure of building occupants to asbestos fibres during normal building use is insignificant, whether as compared to the exposure of insulation workers in the past or as compared to the much lower exposures permitted by the Ontario workplace control limits. Studies of asbestos concentrations in building air have shown that many buildings containing asbestos insulation do not exhibit fibre levels exceeding those in the outdoor air or in buildings not insulated with asbestos. Even when a building exhibits elevated asbestos fibre levels, these are still very low compared to current workplace control limits and are orders of magnitude below the levels to which workers were exposed in the past.”

“We will conclude that it is rarely necessary to take corrective action in buildings containing asbestos insulation in order to protect the general occupants of the buildings. **On the other hand, construction, demolition, renovation, maintenance and custodial workers in asbestos containing buildings may be exposed to significant asbestos fibre levels and may, during their work, cause elevated fibre levels for nearby occupants. THE PROBLEM OF PROTECTING THESE WORKERS, AND OF PROTECTING OCCUPANTS FROM POSSIBLE FIBRE RELEASE AS A RESULT OF BUILDING WORK, IS THE REAL CHALLENGE THAT ASBESTOS INSULATION IN BUILDINGS PRESENTS.**”

2.3 Regulatory Requirements

The above conclusions resulted in the development of Occupational Health and Safety Regulations and guidelines in all Canadian provinces and territories for asbestos work. In Newfoundland, asbestos is regulated under the Newfoundland and Labrador *Asbestos Abatement Regulation* 111/98. In addition to the provincial requirements, a number of federal departmental policies and guidelines have been adopted for the protection of occupants from asbestos exposure. One of these documents is the Treasury Board of Canada Secretariat Hazardous Substances Directive – II, Section 2.9, as it relates to asbestos management. Another such policy is the Public Works and Government Services Canada Departmental Policy (DP:057) - *Asbestos Management* - respecting asbestos management in federally owned or leased building or facilities containing asbestos, March 12, 1997.

An Asbestos Managements Plan is a regulatory requirement in Newfoundland, under the Newfoundland Regulation 111/98, Section 11. An active AMP is an excellent means to ensure that all of the requirements of the Newfoundland Regulation and Treasury Board of Canada

Circular TB 774012 are met, and to prevent exposure of building occupants to asbestos fibres. For an Asbestos Management Plan to be effective, it is necessary that a quantitative asbestos survey be conducted, and that a process be in place to implement the Plan.

3.0 SUMMARY OF ASBESTOS CONTAINING MATERIAL SURVEY

The Atlantic Cool Crop Research Facility (Building 25) is located on the Brookfield Road, Mount Pearl, NL. The Building has been used as an agricultural research facility since its original construction in the mid 1960s. An asbestos containing material (ACM) survey was conducted by AMEC at the Site Building in December 2006.

As part of the ACM Survey, AMEC interviewed Mr. Frank Ralph, Facility Manager, 1980 - present (the "Site Representative") to gain information related to past activities at the Site Building. According to the Site Representative, three structures were attached to Building 25 at different time periods; namely a greenhouse (late 1960s), the Provincial Lab Building (1982) and Building 39 (1996). It is noted that the aforementioned attached structures are not included as part of this asbestos Survey. Also according to the Site representative, major renovations to Building 25 have included new boilers (1991), new roof and ventilation system (1992), replacement of ductwork above all fume hoods (1996), removal of interior wall between Room Nos. 1-18 and 1-19 (2001), removal of fume hood in Room No. 1-20 and installation of stainless steel lining in two other fume hoods (2001) and painting throughout the Building (2001 - 2003).

Building 25 is a three-story building, which occupies an approximate footprint area of 760 m². The Building is primarily of concrete construction and contains offices, laboratories, freezer rooms, washrooms, library, meeting room, boiler room, wet bench area and various mechanical rooms. The exterior walls of the Building consist of concrete block, poured concrete or brick. Interior walls consist of a mix of concrete block, poured concrete or plaster (over brick). Some office walls on the basement level contain gypsum board, which was reported by the Site representative to be installed over plaster approximately 5 years ago. Ceilings are a combination of suspended (lay-in) tiles, plaster or bare concrete. Floors were observed to be a mix of vinyl tiles, terrazzo or bare concrete. It was reported by the Site Representative that the entire roof, supported by steel girders, was totally striped and replaced with a layered roof and membrane approximately 15 years ago.

A total of fifty-two (52) bulk samples of suspect ACMs were sampled and submitted to the AMEC Analytical Laboratory in Mississauga, Ontario, for analysis using a combination of dispersion staining techniques and Polarized Light Microscopy (PLM) methodology as per the National Institute of Occupational Safety and Health Method 9002.

ACMs identified as a result of the Survey are summarized in Table 1. Locations of ACMs are provided on building floor plans contained in the ACM Survey (**Appendix 1**). Photographs of identified ACMs are provided in **Appendix 6**.

Table 1 - Summary of Asbestos Containing Materials

Descriptions and Locations

Walls and Ceilings

Non-friable asbestos containing plaster. Four of nine samples of wall/ceiling plaster were found to contain ACM (2 - 5 % chrysotile). AMEC's review of the previous sampling work by Pinchin Leblanc Environmental Ltd. (PLEL) also showed that three of eight plaster samples were ACM. Plaster walls and ceilings are located in portions of all three floors of the Site Building. See ACM Survey in **Appendix 1** for locations. Some plaster walls are located behind the gypsum board. Due to the non-homogeneous nature of this material, all ceiling and wall plaster within the building should be treated as ACM. It should be noted that even though, when in good condition, the wall and ceiling plaster are considered non-friable in-situ, these plasters become friable during demolition, cutting or abrasion.

Note: Based on a review of the original construction drawing of the facility and observations made during the survey, the majority of gyproc walls in the building have plaster walls located behind them. Refer to the attached ACM survey for likely location of covered plaster walls.

Flooring

Non-friable asbestos containing vinyl floor tiles.

- All 23 x 23 sq. cm (9 inch.) floor tile sampled within the building is ACM (3 - 12% chrysotile). The 23 x 23 sq. cm floor tiles are located in the following area: SB-7 (green and white tile); B-4 (white with black tile); 1-19 (light green with white and dark green); 1-18 (light green with white); 1-6 (red with white); B-2 (light brown with dark brown and white); 1-4 (brown with dark brown); 1-7 (beige with green); and 1-5 (white with brown).
- All 30 X 30 sq. cm (12 inch.) floor tile that was sampled (3 types) is non-ACM.

Wallboard

Non-friable asbestos-containing "Transite" lined fume hoods. The "Transite" lined fume hoods have a grey, fibrous, cementitious appearance and have been painted grayish green. There are three fume hoods that are lined with "Transite" material. The "Transite" fume hoods contain 25% Chrysotile asbestos and are located in Laboratory Room Nos. 1-16, 1-17 and 1-18. It was reported that the "Transite" board for two of these fume hoods is located behind stainless steel sheeting (Room Nos. 1-16 and 1-18).

Pipe Wrap

The majority of insulating pipe wrap (4 samples) within the building is non-ACM and consists of a yellow mineral wool or brown wool-like material, with cellulose outer covering. This is the case throughout the building with two exceptions:

- Insulating pipe wrap on 300 mm dia. steam header, overhead piping (grey/white fibrous material) in the boiler room (20 % Amosite); and
- Insulating pipe wrap (corrugated paper type) on water drain in sub-basement hall (10 % chrysotile).

Pipe Elbows/Joints

Six of seven samples of insulating pipe elbows/joints were found to contain approx. 75 % chrysotile. It can be assumed that all insulating pipe elbows/joints/wrap ends within the building are ACM, with the exception of pipe elbows in Room No. B-26. An estimated total of 560 fittings (elbows and T joints) are located throughout the building. It should also be noted that ACM cement was sometimes used to seal the ends of non-ACM pipe wrap.

Hot Water Tank Insulation

Two hot water tanks in Room B-26 contain insulation comprised of 10 % chrysotile and 30 % amosite.

Other Materials

Other materials found to contain asbestos were:

- One ceiling light fixture fabric located in the basement Dark Room (SB-7) (80 % chrysotile).
- Tar paper on ductwork located in the Wet Bench Room (8 - 10 % chrysotile).

4.0 CLASSIFICATION OF ASBESTOS RELATED WORK

As the risk of exposure to asbestos fibres increases, more stringent work procedures are required for the remediation of the ACMs. Low-risk (Type I), moderate-risk (Type II) and high-risk (Type III) asbestos related work are governed by separate work procedures. Sections 4.1 to 4.3 define the types of asbestos related work as outlined in the PWGSC Departmental Policy (DP:057) and are included to provide an overview of each type of work. Section 4.4 defines a commonly used work procedure (Glove Bag) for Type II asbestos related work.

4.1 Type I or Low-Risk Asbestos Related Work

Asbestos related work classified as Type I or low-risk has minimal risk of releasing asbestos fibres. However, regulations require that precautions be adequate to protect workers from the release of asbestos fibres. Low-risk work procedures cover almost all the asbestos related work involving non-friable ACMs and some very limited activities associated with small quantities of friable ACMs including:

- Installation or removal of a non-friable ACM with a hand tool;
- Disturbance of a non-friable ACM with a power tool equipped with a HEPA dust collector;
- Removal of adhesive patches or dry wall materials where joint filling materials contain asbestos;
- Removal of square vinyl floor tiles;
- Removal or replacement of ten or less asbestos-containing compressed mineral fibre type ceiling tiles;
- Collecting samples of suspect friable ACMs; and
- Working close to friable sprayed asbestos, where the material may be affected by the work activities.

4.2 Type II or Moderate-Risk Asbestos Related Work

Type II or moderate-risk asbestos related work is described as any minor activity that may disturb or involve direct contact with small quantities of friable ACMs that may result in significant potential exposure to airborne asbestos fibres with some health risk. This asbestos related work might include:

- Removal or replacement of more than ten asbestos-containing compressed mineral fibre type ceiling tiles;
- Entry into ceiling spaces, crawl spaces, pipe tunnels, etc. where friable asbestos debris is present;
- The removal of a gales ceiling with the likelihood of a significant quantity of friable ACMs on its surface;
- Minor removal of friable ACMs (removal of not more than 1m² of surface are per work period);

- Minor disturbance of friable ACMs (i.e. to repair valves on piping, install hangers, fastening to a sprayed surface);
- Repair of asbestos mechanical insulation (no limit is imposed as to the amount of repair permitted under Type II conditions); and
- Application of tape, sealant or other covering to pipe or boiler insulation containing asbestos.

4.3 Type III or High-Risk Asbestos Related Work

Type III or high-risk asbestos related work is described, as any activity for which there is a potential for high exposure to airborne asbestos fibres with high health risk. This asbestos related work may include:

- The removal or disturbance of fibre ACMs, other than low or moderate risk asbestos related work;
- The spray application of an encapsulant or sealant to friable ACMs (i.e. encapsulating sprayed fireproofing);
- The use of power tools not equipped with HEPA filtered dust collection device on non-friable ACM;
- Disturbance of the ductwork or air handling equipment serving or passing through areas of buildings with sprayed asbestos-containing fireproofing or insulation; and
- Repair, alteration or demolition of a boiler, furnace, kiln, or similar equipment with asbestos-containing refractory.

4.4 Glove Bag Work Procedure

The removal or repair of asbestos-containing pipe insulation may be conducted using Type II (moderate-risk) procedures. Another option for the removal of asbestos-containing pipe insulation is the glove bag procedure, which is a polyethylene containment bag which fastens around the pipe insulation to be removed and is sealed onto the pipe system. The glove bags are equipped with sealed armholes and a pouch for tools inside the glove bag that allows removal of the insulation inside the glove bag. Once the asbestos-containing pipe insulation has been removed from the pipe and placed in the lower chamber of the glove bag, a small port is used to wet the inside of the glove bag and wash down the exposed pipe. The lower chamber is then re-sealed prior to removal of the glove bag.

5.0 ROLES & RESPONSIBILITIES

This section outlines the responsibilities of both the key personnel identified in the AMP and other building occupants. A Facility Asbestos Coordinator (FAC) should be established for the facility. The FAC should be someone in a senior position who is knowledgeable of the facility and on-site operations and activities, and should be one site on a full time basis (i.e. property manager or maintenance supervisor). The FAC should receive at a minimum, appropriate training in the area of asbestos management, including classification and identification of asbestos related work, from a qualified trainer.



Table 2 presents the key personnel identified in the AMP.

Table 2 - Key Personnel Identified in the Asbestos Management Plan	
Title	Name, address, phone numbers and email addresses
Facility Asbestos Coordinator	Name: Address: Telephone: Cell Phone: Fax: Email:
Property Manager	Name: Address: Telephone: Fax: Email:
Facility Manager / Project Manager	Name: Address: Telephone: Fax: Email:

The responsibility of the FAC include:

1. Coordinate the asbestos training program with the Property Manager for all personnel involved with the management and maintenance of the facility;
2. Maintain worker asbestos training records;
3. Ensure that relevant tasks and responsibilities of individuals identified in this AMP are being carried out and all documents and records are complete and maintained;
4. Coordinate with the Property Manager to engage an outside consultant or other trained and qualified personnel within Agriculture and Agri-Foods Canada (AAFC) to conduct ACM inspections every two years;
5. Receive and retain copies of Contractor Notification and Acknowledgement (CNA) forms and Asbestos Related Work Records (ARWRs) from Contractors and/or Consultants, or alternative AAFC forms, after the completion of an asbestos related project;
6. Maintain and update the AMP as needed and maintain the binder at a secure location in the facility this is accessible to all staff and outside contractors;
7. Inform the appropriate personnel and contractors (if applicable) regarding planned repair, renovation and maintenance or installation work involving ACMs to be performed in their occupied areas in writing and in advance of work to be performed;

8. Identify planned maintenance activity (Section 6.1.1) by facility staff and determine whether the planned maintenance work will disturb ACMs;
9. Ensure that recommended procedures and safety precautions provided in worker training courses and outlined in this AMP will be followed for planned maintenance work or emergencies involving ACMs;
10. Identify, report and document work related ACM emergencies to the Property Manager and Health Canada;
11. Maintain copies of Asbestos Related Work Records (ARWR) and Contractor Notification and Acknowledgement (CNA) forms, or alternative AAFC forms;
12. Handle asbestos emergencies as outlined in Section 6.3;
13. Assist the outside asbestos consultant or other trained and qualified personnel within AAFC during inspections;
14. Coordinate the labeling of ACMs identified in Section 8.0;
15. Handle questions or requests from facility staff for information regarding asbestos;
16. Prepare and distribute standard notification letters for cleaning contractors and landscaping staff; and
17. Ensure all contractors performing work under their control have completed CAN form.

The responsibilities of the **Property Manager** for the facility include:

1. Ensure facility staff receive the appropriate asbestos training and maintain training records;
2. Approve and initiate an asbestos related project; and
3. Coordinate with FAC to engage an outside consultant or other trained and qualified personnel within AAFC to conduct routine ACM inspections.

The responsibilities of the **Facility Manager / Project Manager** for the facility include;

1. Request information regarding the possible presence of asbestos in the areas of planned projects from the FAC;
2. Notify the FAC of all planned removals / repairs involving ACMs;

3. Ensure that the FAC has notified facility staff and cleaning contractors (if necessary) regarding planned Asbestos Related Work;
4. Ensure asbestos related work is overseen and conducted by qualified personnel;
5. Ensure that all contractors performing work under their control have completed a CNA form (**Appendix 2**); and
6. Submit copies of CNAs, ARWRs and asbestos consultant reports (if applicable) to the FAC upon completion of work.

Certain types of work will require the use of outside contractors and consultants and are best handled by outside contractors and / or consultants. Therefore, in these circumstances the contractor and consultant should be responsible for the following:

Asbestos Consultant:

1. Update the locations and approximate quantity of ACMs on building plans and forward the updated asbestos plans to the FAC. Updates will be completed after routine inspections (every two years) or an abatement project;
2. Classify asbestos removal or repair work, prepare scope of work or tender documents, hire asbestos contractors and coordinate asbestos related work with the Facility Manager / Project Manager or Property Manager;
3. Fill out the Asbestos Related Work Record (**Appendix 2**) upon completion of asbestos related work and submit it, along with Contractor Notification and Acknowledgement (CNA) from (**Appendix 2**), to the Facility Manager / Project Manager;
4. Provide inspection and air monitoring during asbestos abatement projects. This includes ensuring proper asbestos removal/repair work and safety procedures are followed (Type I, II, etc.) and the specified work outlined in the contract, scope of work or tender is completed; and
5. Provide a written report to the Facility Manager / Project Manager summarizing the asbestos-related work that has been completed during the abatement project and the results of air monitoring tests. The report is to include a copy of the waste manifest.

Asbestos Contractor:

1. Complete and submit to the Facility Manager / Project Manager or the Asbestos Consultant a contractor Notification and Acknowledgement (CNA) form (**Appendix 2**) prior to commencing any work;

2. Arrange the proper storage, transportation and disposal of any asbestos waste generated during asbestos related work activities;
3. Supply waste manifests upon disposal to the Asbestos Consultant; and
4. Conduct all asbestos abatement project work in accordance with applicable Federal and Provincial Regulations.

Non-Asbestos Contractor:

1. Complete and submit a Contractor Notification and Acknowledgement (CAN) form to the Facility Manager / Project Manager or FAC prior to conducting any work in areas where asbestos-containing materials have been identified; and
2. Stop or do not commence work and contact the FAC if materials are encountered or identified in the work areas that are suspected to contain asbestos.

Facility personnel including cleaning contractors and landscaping staff:

1. Contact the FAC prior to conducting any maintenance work or attaching or removing anything from interior walls/ceilings and exterior foundation walls or other surfaces; and
2. Report any damage to interior and exterior walls or other building components to the FAC.

6.0 ASBESTOS RELATED WORK PROCEDURES

It is understood that some AAFC staff are trained to conduct asbestos related work, however some of this work may also be performed by an outside consultant or contractor. Procedures for conducting asbestos related work activities, taken from excerpts of the PWGSC AMP document dated March 2000, are included in **Appendix 3**. The excerpts include details related to the following activities:

- Evaluation and Recommendation Criteria for Control of Asbestos Containing Material
 - Assessment of Condition
 - Evaluation of Accessibility
 - ACM Debris
 - Action Matrix and Definitions;
- Type 1 Work Procedures;
- Type 2 Work Procedures;
- Glove Bag Work Procedures; and
- Respirator Fitting, Inspection, Cleaning and Disinfection.

It is noted that an outside contractor/consultant or Regional Asbestos Coordinator (if designated), on behalf of the FAC and Project Manager, will classify the disturbance of asbestos materials as Type 1, 2 or 3. It is noted that details related to Type 3 work procedures are not provided in **Appendix 3**. Type 3 work procedures include all work not permitted under the Type 1 and 2 classifications and the aforementioned individual is responsible to review or direct all maintenance work under this classification. It is further noted that all type 3 asbestos work in occupied buildings requires daily inspections and air monitoring and final clearance air testing.

In order to prevent or minimize the chances of asbestos fibre releases, facility staff will not conduct any renovations or disturbances that may damage building materials containing ACMs, unless the work is performed in accordance to the procedures outlined in **Appendix 3**. Activities that may disturb asbestos containing building materials include:

- removing or sanding plaster walls / ceilings;
- drilling, sanding or cutting into “transite” panels lining the hoods located in laboratories 1-17, 1-18, and 1-19 of the building;
- removing or disturbing pipe wraps on large diameter overhead piping located in the Boiler Room and pipe insulation on water drain located in the sub-basement wall;
- using high revolution floor polishers on 23 cm sq. (9” sq. tiles) ACM floor tiles;
- removing or disturbing pipe cement elbows (exception is Room B-26);
- removing or disturbing Hot Water Tank Insulation (Room B-26); and
- removing or disturbing tar paper on ductwork.

During the survey, a number of areas were noted that will require immediate action due to the damaged or deteriorated condition of ACMs. Table 3 provides a summary of these areas.

Table 3 - Summary of Damaged or Deteriorated ACMs Requiring Immediate Action

Type of Damaged/Deteriorated ACM	Location	Recommendation
Small accumulation of dust and debris which contains trace amounts of actinolite located on the storage area floor below pipe lagging.	Room No. B-25 - Storage area located next to Hot Water Tank Room off Wet Bench area.	Until area is cleaned using a professional asbestos abatement contractor or trained and qualified personnel within AAFC, post signage to contact maintenance supervisor prior to entering the Storage Room immediately adjacent to the Hot Water Tank Room (Room B-26).
Deteriorated plaster ceiling.	Room No. 1-16 - From door entrance, left hand top corner area.	Temporarily cover areas with 6 mil polyethylene or plywood type material until area can be properly cleaned and stabilized by a professional abatement contractor or trained and qualified personnel within AAFC.
Deteriorated plaster ceiling.	Room No. B-21 (freezer room) - From door entrance, directly ahead.	Temporarily cover areas with 6 mil polyethylene or plywood type material until area can be properly cleaned and stabilized by a professional abatement contractor or trained and qualified personnel within AAFC. Note that although analysis of ceiling plaster in this room showed no asbestos was detected, this material should be treated as asbestos based on positive results of similar samples and non-homogeneous nature of material.
Deteriorated plaster wall.	Room No. SB-1(boiler room) - From door entrance, left hand far corner area. Wall height of approx. 2.0 to 5.0 m above floor.	Temporarily cover areas with 6 mil polyethylene or plywood type material until area can be properly cleaned and stabilized by a professional abatement contractor or trained and qualified personnel within AAFC.
Deteriorated plaster wall.	Room No. 1-20 - From door entrance, directly ahead on opposite wall near pencil sharpener.	Seal small area of damaged plaster with drywall joint compound until area can be properly cleaned and stabilized by a professional abatement contractor or trained and qualified personnel within AAFC. Note that although analysis of wall plaster in Room No. 1-20 showed no asbestos was detected, this material should be treated as asbestos based on positive results of similar samples and non-homogeneous nature of material.
Deteriorated 300 mm piping steam header containing amosite.	Located in ceiling area enclosed exit to the Boiler Room.	Temporarily cover over with 6 mil polyethylene or equivalent until asbestos material is removed by a professional abatement contractor or trained and qualified personnel within AAFC.

6.1 Identification of Work That May Involve Asbestos

The first step in any asbestos abatement work is to identify the potential for work to disturb ACM. The following are the three processes by which work is initiated at the building and asbestos concerns are identified.

6.1.1 Planned Maintenance

Planned maintenance involves any maintenance activity carried out on a routine basis by the building staff. The Facility Asbestos Coordinator (FAC) will review all planned maintenance and determine if the planned maintenance activity will disturb any ACMs. If it is determined that ACM will be disturbed, the FAC will contact the Property Manager, who can approve and initiate an Asbestos Related Work Project.

6.1.2 Minor Repair

Minor repairs generally refer to maintenance work that can be engaged by the facility staff without the assistance of a Facility Manager / Project Manager. Prior to the initiation of minor repairs or work by facility staff that will require a modification to the infrastructure of a building, the FAC will be contacted and determine whether the work will potentially disturb any identified ACM. If it is determined that ACM will be disturbed, the FAC contacts the Facility Manager / Project Manager, who can approve and initiate an Asbestos Related Work Project.

6.1.3 Project Work

Project work typically involves a substantial change to the infrastructure of the building. These projects are initiated and managed by the Facility Manager / Project Manager. The facility Manager / Project Manager will identify the areas affected from the floor plan and submit them to the FAC. In reviewing the floor plan and the ACM Survey presented in **Appendix 1**, the FAC will determine if the project will disturb any identified ACM. If it is determined that ACM will be disturbed, the Property Manager can approve and initiate an Asbestos Related Work Project by the Facility Manager / Project Manager.

6.2 Asbestos Project

The initiation of an asbestos project involves the Property Manager ensuring that the Facility Manager / Project Manager undertakes the work in accordance with Federal policies. The Facility Manager / Project Manager will then notify the FAC. The FAC is responsible for notifying the building staff and cleaning staff, when appropriate. The Facility Manager / Project Manager will then engage either trained and qualified AAFC staff or an outside consultant and contractor. The Project Manager will ensure that only qualified personnel will be engaged to conduct and monitor asbestos projects. The Facility Manager / Project Manager will ensure the Contractor Notification and Acknowledgement Form (CNA), or alternative AAFC form, is received and confirm that all building and cleaning staff have been notified (if appropriate) before initiating the abatement. The outside consultant will be responsible for monitoring the

abatement as per the terms of their contract. The consultant will prepare and submit the Asbestos Related Work Record (ARWR) and an asbestos abatement report directly to the Facility Manager / Project Manager, who will forward a copy to the FAC. The FAC is responsible for ensuring a copy of this information is maintained in the facilities AMP records. The Consultant is also responsible for updating the ACM location plans presented in the ACM survey in **Appendix 1** and submitting it to the FAC. The FAC is responsible to update the AMP.

6.3 Asbestos Emergency Response Procedures

In the event of an emergency, such as the partial collapse of a ceiling with asbestos-containing plaster, special procedures are generally needed to minimize the spread of fibres throughout the building. These procedures are needed whether the ACM disturbance is intentional or unintentional. Therefore, in the event of an asbestos release episode, **the following procedures, in accordance with PWGSC's Department Policy (DP:057), will be followed:**

- Clear the area of all occupants;
- Isolate the area by closing doors and/or erecting barriers to restrict airflow as well as access to the site;
- If asbestos fibres could enter the HVAC system, the system should be modified to prevent fibre entry or be shut down and sealed off;
- Post warning signs; and
- Notify the Facility Asbestos Coordinator regarding the asbestos disturbance. The Facility Asbestos Coordinator will notify the Property Manager to arrange for removal, clean-up or repair of the asbestos material by qualified personnel. This may require asbestos consultants and/or contractors to develop a strategy for the cleanup operations.

Prior to restarting the HVAC system in the area, a careful visual inspection and final asbestos clearance air monitoring will be conducted to verify satisfactory cleanup.

7.0 PERIODIC INSPECTIONS

The Property Manager will coordinate the routine ACM inspections that will be completed by an outside asbestos consultant or other trained and qualified personnel within AAFC. The inspections involve identifying and recording changes in the condition of the ACMs including damage and deterioration, as well as changes in the use and activity of spaces containing ACMs. Inspection should be conducted every two years for ACMs located at this facility. During the inspections, changes in the condition of the ACM or use of space should be documented. The Property Manager will ensure that a procedure is in place to collect and maintain all routine inspection documentation and reports. The asbestos information will be maintained in the AMP at the facility.

In addition, facility staff will be trained to recognize damage and changes in the condition of ACMs and suspect ACMs. Facility staff who observe any changes to the condition of the ACMs will notify the Facility Asbestos Coordinator immediately.

A sample checklist for the inspection of Asbestos-Containing Materials is contained in **Appendix 4**.

8.0 LABELING

The Facility Asbestos Coordinator will coordinate labeling the ACM. While not a regulatory requirement, labeling of exposed ACM that can be easily disturbed and subsequently release asbestos fibres, is considered a best management practice. Labeling should be conducted by an asbestos consultant.

Typically, a label should be placed directly on the asbestos containing material or on a highly visible wall in the room with asbestos-containing wall/ceiling plaster or wallboard and note the following:

**DANGER
CONTAINS ASBESTOS
Do Not Disturb**

The labels will help remind facility staff and/or outside contractors of the presence of asbestos in the material.

9.0 ASBESTOS TRAINING

Under Section 7 of Newfoundland and Labrador Regulation 111/98, an owner of a building is required to institute and maintain a training program for workers and occupants in the building who are likely to work in close proximity to and may disturb the ACMs.

A training program designed to address the specific needs of the facility staff will be developed and conducted. The training requirements will consist of instruction in:

1. The hazards of asbestos exposure;
2. Identification of suspect ACMs;
3. Roles and responsibilities; and
4. Emergency procedures.

Instruction and training will be conducted by competent personnel who are fully qualified as a result of their knowledge and experience with the requirements of the asbestos regulations. They will be familiar with performance standards established by the asbestos regulations, and knowledgeable of potential or real danger to health or safety in the work place related to asbestos issues.

Typical awareness and management training requirements will consist of instruction in:

- Introduction to asbestos in general;
- Review and identification of ACM specific to each applicable building;
- Overview of asbestos inventory and assessment reports;
- Friable and non-friable asbestos products;
- Insulation used on mechanical systems;
- Health effects - occupational and non-occupational;
- Provincial and federal asbestos guidelines and regulations;
- Classification of asbestos work;
- Asbestos management;
- Worker protection; and
- Asbestos control options.

The Property Manager will ensure procedures are in place to maintain a list of trained workers with the date and type of training. An example form for maintaining a list of trained employees is provided in **Appendix 5**. New facility staff will be informed of the presence of ACMs and briefed on the AMP before they begin work, and at the earliest possible convenience they will attend a training program.

10.0 NOTIFICATION OF CONTRACTORS

The FAC will inform cleaning contractors, landscaping staff, and outside contractors (if applicable) about the location and physical condition of the ACMs that are located in close proximity, and stress the need to avoid disturbing the material. Facility staff will be notified about the presence of ACMs at the implementation of this AMP. Cleaning and landscaping staff and outside contractors will be notified for two reasons:

1. The law requires that owners inform building occupants of any potential hazard in their vicinity; and
2. Informed persons are less likely to unknowingly disturb the material and cause dust to be released into the air.

Outside contractors will be informed about the presence of ACMs in the work location by the FAC or the Facility Manager / Project Manager prior to commencement of their work. Contractors must sign a Contractor Notification and Acknowledgement form prior to conducting any work (**Appendix 2**).

The FAC will inform cleaning contractors and landscaping staff by sending them a letter notifying them of the presence and location of ACM that is in close proximity to their work areas. The information given all contractors doing work at the facility will contain at least the following points to reflect the building conditions:



- Asbestos has been found at the Atlantic Cool Crop Climate Research Facility (Building 25) and is located in the following areas:

- Most ACMs in the Atlantic Cool Crop Climate Research Facility (Building 25) are in good condition and do not pose a risk to human health, with the following exceptions:

- Asbestos only presents a health hazard when fibres become airborne and inhaled. The mere presence of ACMs does not represent a health hazard.
- Do not disturb the ACMs. Activities that may disturb ACMs include cutting, drilling, sanding, or removing the above mentioned building materials. Contact the Facility Asbestos Coordinator to make the necessary arrangements if you wish to undertake an activity that may disturb any ACM.
- Report any evidence of disturbance or damage of ACMs to:
Name:....., Facility Asbestos Coordinator
Telephone:
- Facility staff are taking special precautions during their work to guard against disturbing ACMs.
- Report any improper action (relative to ACMs) to the Facility Asbestos Coordinator.
- All ACMs and suspect ACMs are inspected periodically and additional measures will be taken if needed to protect the health of facility staff.

The Facility Asbestos Coordinator will inform facility staff and contractors (if applicable) at least one week in advance of all planned repair, renovation, maintenance or installation work to be completed in the relevant buildings that may disturb ACMs.

11.0 RECORD KEEPING

Documentation regarding any asbestos related activities must be retained. The FAC will ensure that procedures are in place and are followed to maintain the following documentation/records.

1. Work records documenting all asbestos-related activities, including, but not limited to, repair, enclosure and removal work done onsite must be retained indefinitely;
2. Training records shall be maintained for the duration of employment plus 1 year. Copies shall be placed in worker personnel files;

3. Notification of the presence of ACMs and other asbestos related documents and correspondence with facility staff, contactors and consultants shall be maintained indefinitely;
4. Notification letters sent to cleaning contractors (or other contractors) prior to asbestos related work in areas they may be working in shall be maintained indefinitely;
5. Asbestos survey reports, updates and addenda that reflect the changing condition and quantity of ACMs will be maintained indefinitely;
6. A completed asbestos waste manifest for disposed ACMs must be maintained indefinitely; and
7. The AMP shall be maintained on-site as long as the ACMs remain in the workplace.

12.0 CLOSURE

This report presents the methodology and findings of an asbestos containing material Survey and development of an asbestos management plan for Agriculture and Agri-Foods Canada Building 25, located in Mount Pearl, NL, reflecting AMEC's best judgment using information reasonably available at the Site at the time of AMEC's Site visit. AMEC has prepared this report using information understood to be factual and correct and shall not be responsible for conditions arising from information or facts that were concealed or not fully disclosed to AMEC at the time of the Site visit.

The limitations of the ACM Survey are specified in **Appendix 7**.

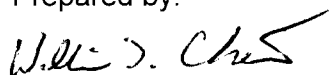
This report has been prepared for the exclusive use of Public Works and Government Services Canada. The work described herein was conducted in accordance with the generally accepted assessment practices, with the conclusions based on the Site information readily available at the time of completing the work. No other warranty, expressed or implied is made. AMEC will not be responsible for the use of this report by any third party, or reliance on or any decision to be made based on it without the prior written consent of AMEC. AMEC accepts no responsibility for damages, if any, by any third party as a result of decisions or actions based on this report.

We trust the above information is satisfactory. If you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,


AMEC Earth & Environmental

Prepared by:



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APPENDIX 1

ASBESTOS CONTAINING MATERIAL SURVEY

1.0 INTRODUCTION

AMEC Earth and Environmental, a division of AMEC Americas Limited (AMEC) was retained by Public Works and Government Services Canada (PWGSC) on behalf of Agriculture and Agri-Foods Canada to conduct an asbestos containing material (ACM) Survey of the Atlantic Cool Crop Climate Research Facility (Building 25) located in Mount Pearl, Newfoundland and Labrador (the "Site Building"). The Site Building is currently occupied by a functioning agricultural research facility. The General Site Location is presented in Figure 1 (Appendix A).

The objective of the ACM Survey was to determine the type, presence, quantity and location of asbestos-containing materials (ACMs) at the Site Building.

The Project was carried out in accordance to the PWGSC Terms of Reference dated November 2006 and the scope of work detailed in the AMEC proposal dated 16 November 2006.

1.1 BACKGROUND INFORMATION

As part of the ACM Survey, AMEC interviewed Mr. Frank Ralph, Facility Manager, 1980 - present (the "Site Representative") to gain information related to past activities at the Site Building. It was reported by the Site Representative that the Building has been used as an agricultural research facility since its original construction in the mid 1960s.

According to the Site Representative, three structures were attached to Building 25 at different time periods; namely a greenhouse (late 1960s), the Provincial Lab Building (1982) and Building 39 (1996). It is noted that the aforementioned attached structures are not included as part of this asbestos Survey. Also according to the Site representative, major renovations to Building 25 have included new boilers (1991), new roof and ventilation system (1992), replacement of ductwork above all fume hoods (1996), removal of interior wall between Room Nos. 1-18 and 1-19 (2001), removal of fume hood in Room No. 1-20 and installation of stainless steel lining in two other fume hoods (2001) and painting throughout the Building (2001 - 2003).

Building 25 is a three-story building, which occupies an approximate footprint area of 760 m². The Building is primarily of concrete construction and contains offices, laboratories, freezer rooms, washrooms, library, meeting room, boiler room, wet bench area and various mechanical rooms. The exterior walls of the Building consist of concrete block, poured concrete or brick. Interior walls consist of a mix of concrete block, poured concrete or plaster (over brick). Some office walls on the basement level contain gypsum board, which was reported by the Site representative to be installed over plaster approximately 5 years ago. Ceilings are a combination of suspended (lay-in) tiles, plaster or bare concrete. Floors were observed to be a mix of vinyl tiles, terrazzo or bare concrete. It was reported by the Site Representative that the entire roof, supported by steel girders, was totally stripped and replaced with a layered roof and membrane approximately 15 years ago.



1.2 PREVIOUS ASBESTOS SAMPLING

As part of the ACM Survey, PWGSC provided AMEC with copies of previous asbestos sample results and construction drawings for review.

Between 1995 and 2004, Pinchin LeBlanc Environmental Ltd. (PLEL) collected 14 samples of bulk building materials within Building 25. Eight of these samples consisted of wall or ceiling plaster and three samples consisted of lab fume hood ductwork materials. The remaining samples consisted of pipe elbow cement, floor tile and dust.

A summary of the PLEL suspect ACM samples, compiled by AMEC, is provided in Table 1-1. Laboratory certificates for the PLEL samples are also included in Appendix B.

TABLE 1-1
Summary of PLEL Suspect ACM Sampling 1995 - 2004
Agriculture and Agri-Foods Canada Building 25, Mount Pearl, NL

PLEL Sample Date	PLEL Sample No.	Material Description	Location Room #	Asbestos Result Percent & Type
7-Apr-95	02-151-001AC	Lab Fume Hood, elbow cement , homogeneous, grey, soft, cementitious material	NA	50 - 75 % Chrysotile
7-Apr-95	02-151-002AC	Lab Fume Hood, cement pipe, straight , homogeneous, grey, hard, cementitious material	NA	10 - 25 % Chrysotile 5 - 10 % Crocidolite
12-Mar-96	01-512-100	3 phases: Fume hood exhaust insulation a) homogeneous, black tar b) homogeneous, brown, fibrous material c) homogeneous, gold, fibrous material	NA	a) 5 - 10 % Chrysotile b) ND c) ND
12-Jan-96	02-512-003	Contents of vacuum bag , brown dust	NA	ND
20-Dec-96	Sample #1	Plaster finish coat , homogeneous, white, hard, cementitious material	NA	ND
21-Mar-97	02-832-001	Heating line elbow cement , homogeneous, grey, soft, cementitious material	B-7	50 - 75 % Chrysotile
21-Mar-97	02-832-002	9" x 9" floor tile , homogeneous, green, consolidated material	B-5	1 - 5 % Chrysotile
21-Mar-97	02-832-003	Wall finish , homogeneous, grey, hard, cementitious material	Kitchen	1 - 5 % Chrysotile
21-Mar-97	02-832-004	2 phases: Wall finish a) homogeneous, white, hard, cementitious material b) homogeneous, white, hard, cementitious material	B-7	a) ND b) <0.1% Chrysotile
21-Mar-97	02-832-005	Wall finish , homogeneous, beige, hard, cementitious material	B-5	<0.1% Chrysotile
18-Mar-04	001	2 phases: Plaster on wall around column a) homogeneous, white, soft, cementitious material b) homogeneous, tan, granular, cementitious material	1-18	a) ND b) 1 - 5 % Chrysotile
23-Mar-04	001	2 phases: Plaster ceiling a) homogeneous, white, soft, cementitious material b) homogeneous, tan, granular, cementitious material	1-19	a) ND b) 0.1 - 1.0 % Chrysotile
23-Mar-04	002	2 phases: Plaster on ceiling a) homogeneous, white, soft, cementitious material b) homogeneous, tan, granular, cementitious material	1-16	a) ND b) 0.1 - 1.0 % Chrysotile
23-Mar-04	003	2 phases: Plaster ceiling a) homogeneous, white, soft, cementitious material b) homogeneous, tan, granular, cementitious material	1-20	a) ND b) 1 - 5 % Chrysotile

A review of the results revealed that three of the eight plaster samples were found to be asbestos containing material, while four others contained only trace amounts of asbestos.

The lab fume hood ductwork materials (tar, insulating cement and pipe), floor tile and insulating pipe cement were also found to be asbestos-containing. A dust sample collected from a vacuum bag was non-ACM.

Prior to commencement of the ACM Survey, AMEC identified data gaps and targeted specific building materials for sampling and analysis in order to obtain additional information. Also, during the Survey, AMEC investigated the status of previously identified asbestos containing materials and, in some cases, collected similar materials to corroborate the previous data. A discussion of the previous work has been incorporated into applicable sections of the Survey findings (Section 4.0).

2.0 SCOPE AND METHODOLOGY

2.1 REGULATORY FRAMEWORK

Asbestos-Containing Materials (ACMs) are fibrous hydrated silicates, and can be found in building materials as either “friable” or “non-friable” asbestos products. Friable asbestos refers to materials that can be readily crumbled using hand pressure, separating asbestos fibres from the binding materials with which they are associated. Non-friable material refers to asbestos that is associated with a binding agent (such as tar or cement), preventing ready release of airborne fibres. Friable asbestos is commonly found in boiler and pipe insulation. Non-friable or bound asbestos is typically found in roofing tars, floor and ceiling tiles, and precast asbestos cement products commonly referred to as “transite”.

ACMs were discontinued from use in Canada in the late 1970s/early 1980s, although non-friable asbestos is still found in many more recent buildings. Additional background information on asbestos is contained within Appendix D.

ACMs in the workplace are regulated under the following federal and provincial policies and regulations:

Federal:

- Treasury Board of Canada Secretariat Hazardous Substances Directive - II, Section 2.9 as it relates to asbestos management; and
- Public Works and Government Services Canada Departmental Policy (DM: 057) - *Asbestos Management*, dated March 12, 1997.

Provincial:

- Newfoundland and Labrador *Asbestos Abatement Regulations* (Nfld. Reg. 111/98).

Under these regulations, materials containing greater than 1% asbestos fibers are considered asbestos-containing and should be managed in accordance with the applicable regulations.

As Building 25 is located on a federal site, the building and employees are under federal, not provincial, jurisdiction. Typically, federal buildings and employees come under the Canada Labour Code, however, contractors would be under provincial jurisdiction.

2.2 SURVEY METHODOLOGY

AMEC performed an ACM Survey of Building 25 between December 6th and 8th, 2006. The Survey included a visual inspection and intrusive bulk sampling program of suspected ACMs and was performed by Mr. Bill Chew, B.Sc., CET and Mr. John Krilow, CET of AMEC. The assessment was as non-intrusive as possible with regard to building components. Suspect ACMs were visually inspected and sampled using industry standard protocols and procedures and the requirements of the above-noted federal and provincial policies and regulations.

AMEC was accompanied by the Facility Manager, Mr. Frank Ralph ("Site Representative") or a designate during the ACM Survey.

During the Survey, all accessible areas of the Site Building were examined for the presence of suspected friable and non-friable ACMs. Materials suspected of containing asbestos (floor tiles, wall board, insulation, pipe wrap, wall plaster, etc.) were sampled by removing a small section of material (650 mm²) using a utility knife and placing the material in a plastic ziplock bag. Where friable materials were sampled, a piece of duct tape was later placed over the sampling location.

Bulk samples were collected from materials that appeared visually distinct and therefore repetitive testing was generally not performed. The presence, location, condition and approximate quantities of each suspect ACM were recorded. Each material sampled was assigned a sample number and location recorded on building floor plans.

A total of fifty-two (52) bulk samples of building materials suspected of containing asbestos were collected and submitted to AMEC's laboratory in Mississauga, ON for analysis of asbestos content using a combination of dispersion staining techniques and Polarized Light Microscopy (PLM) methodology. In addition, four random duplicate samples were submitted to the laboratory as part of the quality control (QC) program.

Sampling locations are identified on Building floor plans, provided on Figure Nos. 2, 3 & 4 (Appendix A). Photographs of some sampling locations are provided in Appendix 6. A summary of suspected ACM samples is provided in Table C-1 (Appendix C). Laboratory certificates are also included in Appendix C.

3.0 SURVEY LIMITATIONS

This ACM Survey was conducted between December 6th and 8th, 2006. This report reflects the observations, findings, and analysis of materials sampled during this time. The observations are based on the specific areas inspected. The scope of the ACM Survey included mechanical equipment, structures, and finishes located in accessible areas of the Building. Analytical results were used to quantify the sampled materials at the specific sample locations. Materials found to be visually similar to those analyzed, where possible were referenced to specific analyzed samples collected elsewhere. Repetitive testing of similar materials was not performed.

The findings within this report do not reflect potential ACMs in areas not accessed, such as remote space areas, wall cavities and ceilings spaces. It is possible that materials may exist which could not be reasonably identified within the scope of this investigation or which were not apparent or accessible during the Survey. An area above a suspended tile ceiling, behind a closed door, or behind an access hatch is considered accessible. An area enclosed by gypsum board, plaster, or panelling, roofing materials, boiler refractory, etc., where minor demolition is required to gain entry, is considered non-accessible and was not included as part of this investigation. During future renovations or demolition activities and subsequent removal of interior wall and ceiling materials, the actual quantities of asbestos containing materials can be verified. Also at this time, analysis of suspect ACM materials may be required if the appearance differs from that of materials previously confirmed to contain asbestos in adjacent rooms.

It is noted that AMEC gained access to all but one room within the Building during the course of the ACM Survey; namely the locked vault (Room No. B-12). The Site Representative did not possess the lock combination to this room at the time of the Survey.

Roofing materials such as sealers on flat roofs may contain asbestos. These items are typically not sampled as it may damage the integrity of the roof, resulting in leaks. In addition, it was reported by the Site Representative that the entire roof was totally striped and replaced with a layered roof and membrane approximately 15 years ago.

4.0 SURVEY FINDINGS

Findings of the ACM Survey are based on visual inspection, sampling of suspect materials and laboratory analyses. The analytical results are summarized in Table C-1 in Appendix C. Laboratory certificates of analysis are also provided in Appendix C. Building floor plans, identifying sampling locations, are provided on Figure Nos. 2, 3 & 4 (Appendix A). Photographs of materials confirmed by the analytical laboratory to be asbestos-containing are contained in Appendix 6.

Results indicate that twenty-five (25) of the fifty-two (52) samples collected contained more than 1 % asbestos fibres. Below is a discussion of the types of materials confirmed to be asbestos-containing.

4.1 MECHANICAL INSULATION

4.1.1 Piping

The majority of insulating pipe wrap observed and sampled (4 samples) within the Building was found to be non-ACM and consists of a yellow mineral wool or brown wool-like material, with cellulose outer covering. This is the case throughout the Building with two exceptions:

- Insulating pipe wrap on 300 mm diameter, steam header piping (white fibrous material) in Room No SB-1 (boiler room) was found to be 20 % amosite asbestos. Based on analytical results and visual observations, 40 linear metres of this pipe wrap was noted to be present in the boiler room (see Photo 6, Appendix 6); and
- Insulating pipe wrap (corrugated paper type) on water drain in sub-basement hall (10 % chrysotile asbestos). Based on analytical results and visual observations, 15 linear metres of this pipe wrap was noted to be located in the sub-basement halls room (see Photo 3).

However, it is noted that asbestos-containing pipe insulation or other mechanical insulation may be present in areas of the Building that are inaccessible, such as within pipe chases, above inaccessible ceilings or inside wall cavities.

4.1.2 Pipe Fittings

Insulating pipe cement was observed on pipe fittings throughout the Building. AMEC collected seven samples of this material as part of the ACM Survey. Six of seven samples of insulating cement located on pipe elbows, joints and pipe wrap ends were found to typically contain approximately 75 % chrysotile asbestos (see Photos 4, 5, 8, 9, 11 & 17).

It can be assumed that all insulating pipe elbows/joints/wrap ends within the Building are ACM, with the exception of pipe elbows in Room No. B-26.

AMEC visually quantified pipe fittings containing insulating pipe cement in accessible areas of the Building, mainly in Room Nos. SB-1 (boiler room), B-25 (wet bench area) and the sub-basement hallways. In order to estimate the total number of pipe fittings containing insulating ACM cement, AMEC removed metal covers on two office heating units to observe the piping configuration. This inspection revealed two fittings containing insulating ACM cement for each heater (See Photos 8 & 9). Therefore, AMEC has assumed that there are two fittings containing insulating ACM cement for every individual heating unit in the Building. This, combined with fittings directly observed, as well as an added 20 % as a margin of error, AMEC has estimated that there are 560 insulating ACM cement pipe elbows, joints and pipe wrap ends in the Building.

It is noted that the previous sampling work, performed by PLEL, showed that a sample of insulating pipe cement collected in Room No. B-7 contained 50 - 75 % chrysotile asbestos. Laboratory certificates for the previous PLEL samples are also included in Appendix B.

Note that the estimated quantity referenced above is based in part on visual observations made on a room-by-room basis, analytical results and discussions with the Site Representative or designate. Repetitive testing of similar materials was not performed.

4.1.3 Heating System

The four boilers and nearby associated piping located in Room No. SB-1 were reported by the Site Representative to have been installed in the early 1990s. However, some piping within this room was also reported to be original.

4.1.4 Hot Water Tanks

Two hot water tanks in Room B-26 contain insulation comprised of 10 % chrysotile asbestos and 30 % amosite asbestos (see Photo 7).

Insulation on the condensate return tank in Room N. SB-1 was sampled and found to be non-ACM.

4.2 THERMAL FIREPROOFING / INSULATION

No blown-in insulation was observed in the ceiling space or exterior walls of the Building. AMEC accessed the ceiling space above Room No. 1-4, through a ceiling hatch, and observed fiberglass insulation. Forty (40) mm styrofoam was observed on the inside of the exterior concrete walls of Room Nos. 1-4 and 1-10, upon removal of the metal heating covers.

4.3 DECORATIVE MATERIALS

No decorative materials, suspected of containing asbestos, were observed in the Building.

4.4 FLOORING

Nine different colours of 23 x 23 sq. cm (9 inch) floor tiles were observed throughout the Building and all were sampled. Analysis showed that all 23 x 23 sq. cm floor tiles sampled within the Building are ACM (3 - 12 % chrysotile asbestos). Photo 1 shows a typical ACM floor tile (photos of other ACM floor tiles having different colours are not provided). The locations of these floor tiles are shown on the Figures in Appendix A. The total quantity of 23 x 23 sq. cm ACM floor tiles within the Building has been estimated at 570 m².

It is noted that the previous sampling work, performed by PLEL, showed that 23 x 23 sq. cm floor tiles in Room No. B-5 contained 1 - 5 % chrysotile asbestos.

All 30 x 30 sq. cm (12 inch) floor tile that was sampled by AMEC (3 types) was found to be non-ACM.

Terrazzo flooring in the hallways and corridors was sampled and found to contain only a trace (< 1 %) of asbestos fibres.

4.5 CEILING TILES

Three types of 0.6 m x 1.2 m, suspended ceiling tiles were observed in the Building. Two of these types were reported by the Site Representative to be installed within the past 10 years. A sample of the third, older type of ceiling tile was analyzed and found to contain no asbestos fibres.

4.6 PLASTER FINISHES

Plaster walls and ceilings were observed in the majority of the Building and were also reported by the Site Representative to be located behind recently installed gypsum board (within the past 10 years). Nine samples of wall and ceiling plaster were collected by AMEC throughout the Building. Four of nine samples of wall/ceiling plaster were found to contain 2 - 5 % chrysotile asbestos (see Photos 12, 13, 14 & 19).

AMEC's review of the previous sampling work, performed by PLEL, showed that three of eight plaster samples, collected from Room Nos. 1-18, 1-20 and a former kitchen (believed to be Room No. B-4), were ACM.

Due to the non-homogeneous nature of this material, all ceiling and wall plaster within the Building should be treated as ACM. Based on the quantity of plaster walls and ceilings directly observed, with an added 20 % as a margin of error, AMEC has estimated that there is 4000 m² of ACM wall and ceiling plaster within the Building.

Some areas of wall/ceiling plaster, located in Room Nos. 1-16, 1-20, B-21 and SB-1, were also observed to be damaged. Note that although analysis of ceiling plaster in Room No. B-21 (freezer room) and wall plaster in Room No. 1-20 showed no asbestos was detected, this material should be treated as asbestos based on positive results of similar samples and non-homogeneous nature of material.

It is noted that both the AMEC and previous PLEL plaster samples showed that the thin (3 - 4 mm thick) white, topcoat layer of plaster was, in all seven cases, found to be non-ACM. The underlying 25 mm thick layer of hard, grey, granular plaster was, in most cases, found to be asbestos-containing (see Photo 13). As it would be impractical to separate these two layers in a major renovation or demolition, the entire thickness of both plaster layers should be treated as an asbestos containing material.

4.7 ASBESTOS CEMENT PRODUCTS

A wallboard material was observed on the interior surfaces of a laboratory fume hood located in Room No. 1-17 (see Photo 16). A sample of this wallboard was analyzed and found to contain 25 % chrysotile asbestos. This type of wall board was also reported to exist below stainless steel sheeting in two other fume hoods. A fourth fume hood was reported by the Site Representative to be constructed only of stainless steel. The total quantity of ACM wallboard (3 fume hoods) has been estimated at 15 m².



It is noted that asbestos-containing, fume hood ductwork materials (i.e. tar, insulating cement and pipe), previously sampled by PLEL (1995 and 1996), was reported by the Site Representative to be removed from all fume hoods in 1996 and replaced with steel.

4.8 OTHER ASBESTOS CONTAINING MATERIALS

A sample of fabric located (0.03 m²) on a ceiling light fixture in Room No. SB-7 (former photography dark room) was analyzed and found to contain 80 % chrysotile asbestos (see Photo 2).

A sample of tar paper located below insulation on a duct in Room No. B-25 was analyzed and found to contain 8 - 10 % chrysotile asbestos (see Photo 10). There are two such ducts in this room (total quantity estimated at 6.25 m²).

4.9 QUALITY CONTROL DISCUSSION

As part of the quality control (QC) program for this Survey, four random duplicate samples of bulk building materials were collected and submitted to the laboratory for the purpose of data comparison as a measure of gauging the quality of the data set. Table 1-2 provides a summary of the duplicate sample results.

TABLE 1-2
Comparison of Asbestos Duplicate Sample Results
Agriculture and Agri-Foods Canada Building 25, Mount Pearl, NL

Sample #	Material Description	Location Room #	Asbestos Result (% & Type)	Relative Percent Difference (RPD)
ACM 9	Floor tile, 23x23 cm, light brown with dark brown and white	B-2	5 % Chrysotile	50 %
ACM D1			3 % Chrysotile	
ACM 37	Tar paper, duct	B-25	8 % Chrysotile	22 %
ACM D2			10 % Chrysotile	
ACM 39	Ceiling plaster, grey granular, with wire mesh	1-16	2 % Chrysotile	NE
ACM D3			Trace Chrysotile	
ACM 40	Ceiling plaster, white cementitious (thin top coat)	1-16	ND	NE
ACM D4			ND	

Notes:
 ND denotes "Not detected".
 NE denotes "Not Evaluated".

Upon review of the duplicate results, two of the four duplicate sample results were found to be equal to or within 50% relative percent difference (RPD), which is considered acceptable precision criteria for the bulk samples. These evaluations are only applicable when both results are at least three to five times the reporting limit. The other duplicate sample results were either non-detectable or slightly above detection limits, therefore these have not been evaluated. Data quality for this ACM Survey is therefore considered valid and results may be used with confidence for decision making purposes.

5.0 SUMMARY OF FINDINGS

Conclusions regarding ACMs at Agriculture and Agri-Foods Canada Building 25 in Mount Pearl, NL, correspond to the professional judgment of AMEC, which is based on results from the Survey as described in this report.

Based upon the results of fifty-two (52) samples of bulk materials and visual comparison of similar materials, ACMs were identified in the subject Building. A summary of all suspected ACM samples is provided in Table C-1 (Appendix C). Table 1-3 lists the estimated quantities of confirmed ACMs found within the Building.

TABLE 1-3
Estimated Quantities of ACMs
Agriculture and Agri-Foods Canada Building 25, Mount Pearl, NL

Material Description	Friable Y/N	Asbestos Result Percent & Type	Estimated Quantity	Comment
Piping				
Pipe wrap insulation, white, fibrous	Y	20 % Amosite	40 linear meters	Room No. SB-1 - Located on overhead, 300 mm dia. steam header pipe. Small damaged portion.
Pipe wrap insulation, corrugated, paper-type	Y	10 % Chrysotile	15 linear metres	Room No. SB-7 and sub-basement hallways - 10 cm dia. drain water pipe.
Pipe Fittings				
Insulating pipe cement, elbows, joints, pipe wrap ends white, cementitious	Y	70 - 80 % Chrysotile	560 total	Located throughout building (except Room No. B-26). Room No. SB-1 - 240 fittings. Room No. B-25 - 110 fittings. Sub-basement Halls - 60 fittings. Various locations, i.e. behind metal heater covers, below stairwells, in hallways - 150 fittings.
Hot Water Tanks				
Tank insulation, white, cementitious	Y	10 % Chrysotile, 30 % Amosite	13.6 m ² total	Room No. B-26 - Two tanks (same material) measuring 2.2 m x 0.8 m dia.
Flooring				
Floor tile, 23x23 cm, various colours	N	3 - 12 % Chrysotile	570 m ² total	Located throughout building (See figures in appendix A). Nine colours include: green with white, white with black, light green with white and dark green, light green with white, red with white, light brown with dark brown and white, brown with dark brown, beige with green, and white with brown.
Plaster				
Ceiling and wall plaster, grey granular.	Y (1)	2 - 5 % Chrysotile	4000 m ² total	Located throughout building (See figures in appendix A). Some plaster locations contain a wire mesh backing.
Wallboard				
Wallboard, interior of fume hood	N	25 % Chrysotile	15 m ² total	Room Nos. 1-16, 1-17 & 1-18 each contain an ACM wallboard-lined fume hood - 5 m ² each.
Other Asbestos materials				
Fabric, ceiling light fixture	N	80 % Chrysotile	0.03 m ²	Room No. SB-7 - 20 cm dia.
Tar paper, duct	N	8 - 10 % Chrysotile	6.25 m ² total	Room No. B-25. Two ducts 3.12 m ² each.

NOTES:

- Although wall and ceiling plaster are considered non-friable in-situ, these plasters become friable during demolition, cutting or abrasion. As a result, wall and ceiling plasters should be treated as friable materials.

The Survey has confirmed that asbestos-containing materials exist at the subject property. The PWGSC DP:057 *Asbestos Management*, requires damaged ACMs be repaired or removed using specific procedures. It also requires the removal of all ACMs that have a potential of being disturbed during planned renovations, and that an Asbestos Management Plan be implemented and kept in place until such time that all ACMs have been removed from the buildings. A certified contractor must complete asbestos repairs or removals.

6.0 CLOSURE

This report presents the methodology and findings of an ACM Survey of Agriculture and Agri-Foods Canada Building 25, located in Mount Pearl, NL, reflecting AMEC's best judgment using information reasonably available at the Site at the time of AMEC's Site visit. AMEC has prepared this report using information understood to be factual and correct and shall not be responsible for conditions arising from information or facts that were concealed or not fully disclosed to AMEC at the time of the Site visit.

The limitations of the ACM Survey are specified in Appendix 7.

This report has been prepared for the exclusive use of Public Works and Government Services Canada. The work described herein was conducted in accordance with the generally accepted assessment practices, with the conclusions based on the Site information readily available at the time of completing the work. No other warranty, expressed or implied is made. AMEC will not be responsible for the use of this report by any third party, or reliance on or any decision to be made based on it without the prior written consent of AMEC. AMEC accepts no responsibility for damages, if any, by any third party as a result of decisions or actions based on this report.

We trust the above information is satisfactory. If you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,

AMEC Earth & Environmental

Prepared by:



John Krilow, CET
Senior Environmental Technologist

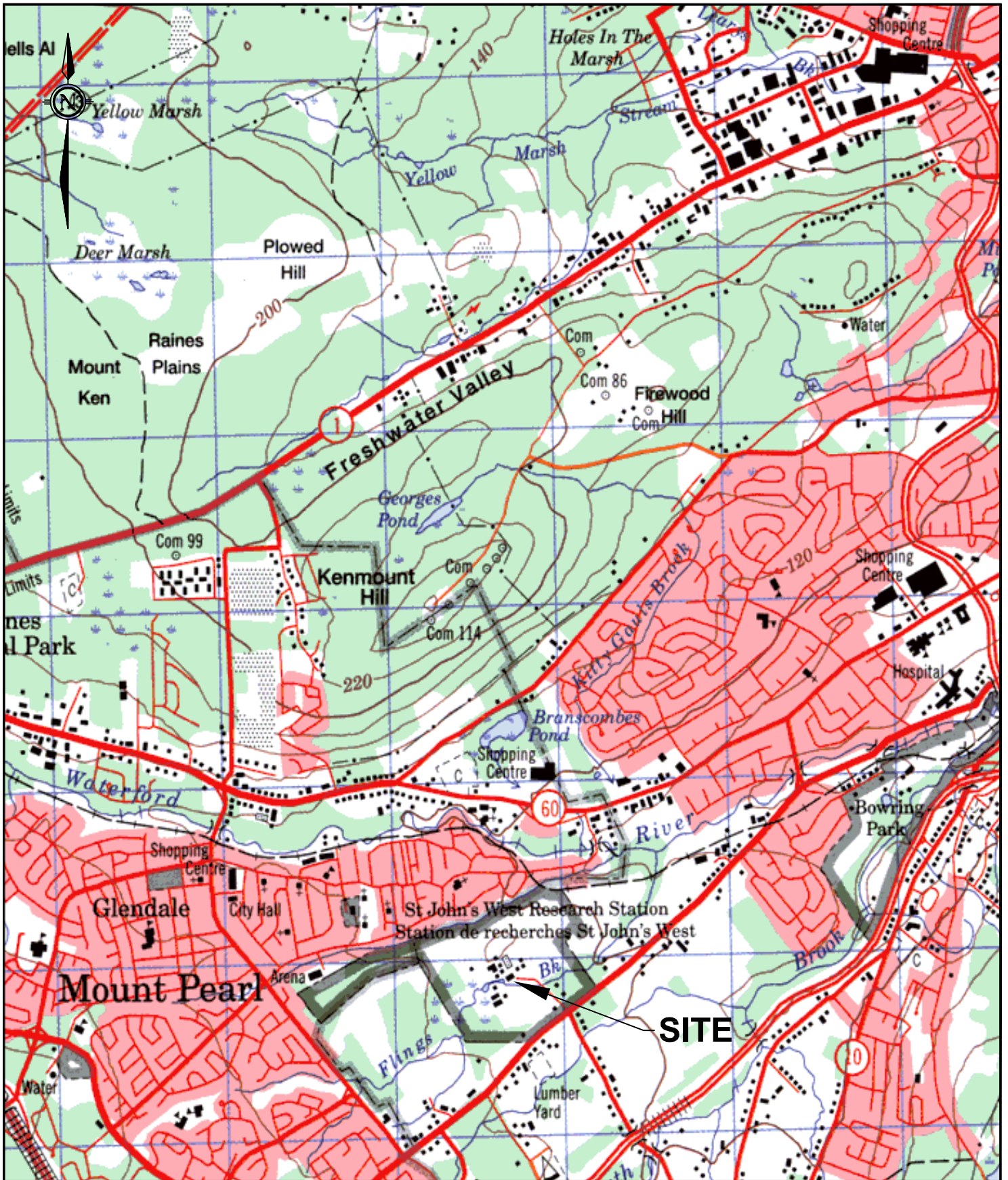
Reviewed by:





Rod Winsor, MSc., P.Eng
Manager Newfoundland & Labrador

APPENDIX A

FIGURES



	Date:		Project:		
	January 16, 2007		GENERAL SITE LOCATION		
 Public Works and Government Services Canada Travaux publics et Services gouvernementaux Canada	Drawn by:		AGRICULTURE AND AGRI-FOODS CANADA BUILDING 25		
	K. Curtis				
	Approved by:		Scale:	Project No.:	Figure No.:
J. Krilow		NTS	TF61076144	1	

NOTE: ALL WALLS ON BASEMENT LEVEL
CONSIST OF PLASTER CONTAINING
ASBESTOS.

SEE PHOTO No.8 (APPENDIX 5) ASSUME 2 INSULATION ACM PIPE
FITTINGS FOR EACH HEATER ON EXTERIOR BUILDING WALLS.

NOTE: CEILINGS IN THIS
HALF OF FIRST FLOOR
CONSIST OF SUSPENDED
(LAY-IN) TILES EXCEPT
STAIRWELLS & ROOM Nos.
1-11 & 1-22 ARE
PLASTER CONTAINING
ASBESTOS AND ROOM No.
1-4 IS GYPSUM BOARD

NOTE: CEILINGS IN THIS
HALF OF FIRST FLOOR
CONSIST OF PLASTER
CONTAINING ASBESTOS
EXCEPT ROOM No. 1-21 IS
SUSPENDED (LAY-IN) TILES



LEGEND

- ACM1 ▲ SUSPECTED ACM SAMPLE LOCATION - CONFIRMED NON-ACM
- ACM1 ▲ SUSPECTED ACM SAMPLE LOCATION - CONFIRMED ACM
- LP1 ● PAINT CHIP SAMPLING LOCATION - CONFIRMED NON-LBP
- LP1 ● PAINT CHIP SAMPLING LOCATION - CONFIRMED LBP
- DENOTES AREA OF CONFIRMED ACM FLOOR TILE
- DENOTES ACM WALBOARD - LINED FUME HOOD
- ACM - DENOTES ASBESTOS CONTAINING MATERIAL
- LBP - DENOTES LEAD BASED PAINT
- MBP - DENOTES MERCURY BASED PAINT

FIRST FLOOR PLAN

SCALE: 1:125



FIGURE 2
SUSPECTED ACM AND LBP/MBP
SAMPLING LOCATIONS

FIRST FLOOR PLAN
AGRICULTURE AND AGRI-FOODS CANADA BUILDING 25
MOUNT PEARL, NL

NOTE: DIGITAL DRAWINGS PROVIDED BY PWGSC.
ORIGINAL DRAWINGS WERE EDITED FOR PURPOSES
OF BUILDING SURVEY AND ARE FOR REFERENCE ONLY

NOTE: ALL WALLS ON BASEMENT LEVEL
CONSIST OF PLASTER CONTAINING
ASBESTOS. MOST OFFICE WALLS CONTAIN
GYPSUM BOARD OVER PLASTER

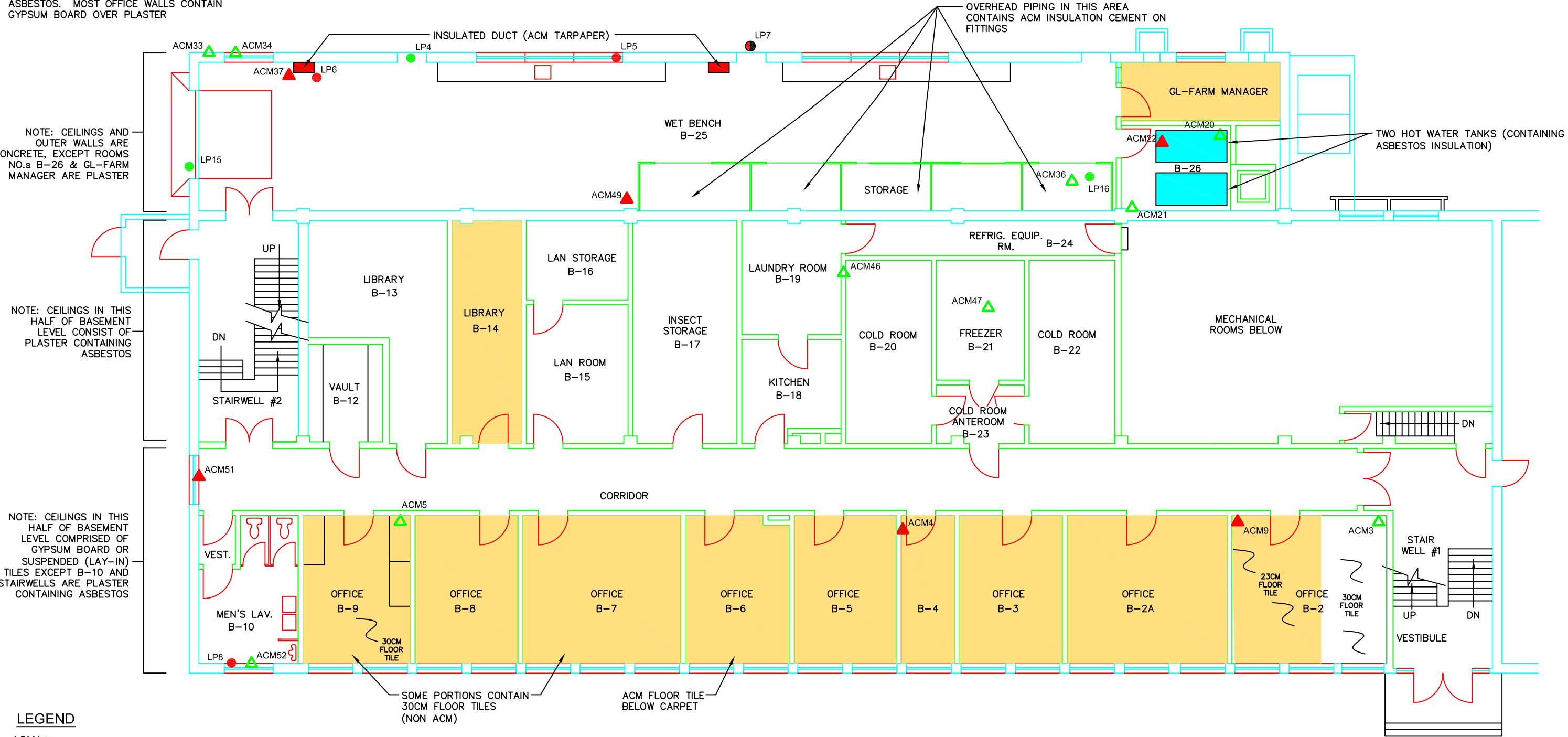
NOTE: CEILINGS AND
OUTER WALLS ARE
CONCRETE, EXCEPT ROOMS
NO.s B-26 & GL-FARM
MANAGER ARE PLASTER

NOTE: CEILINGS IN THIS
HALF OF BASEMENT
LEVEL CONSIST OF
PLASTER CONTAINING
ASBESTOS

NOTE: CEILINGS IN THIS
HALF OF BASEMENT
LEVEL COMPRISED OF
GYPSUM BOARD OR
SUSPENDED (LAY-IN)
TILES EXCEPT B-10 AND
STAIRWELLS ARE PLASTER
CONTAINING ASBESTOS

OVERHEAD PIPING IN THIS AREA
CONTAINS ACM INSULATION CEMENT ON
FITTINGS

TWO HOT WATER TANKS (CONTAINING
ASBESTOS INSULATION)



LEGEND

- ACM1 ▲ SUSPECTED ACM SAMPLE LOCATION - CONFIRMED NON-ACM
- ACM1 ▲ SUSPECTED ACM SAMPLE LOCATION - CONFIRMED ACM
- LP1 ● PAINT CHIP SAMPLING LOCATION - CONFIRMED NON-LBP
- LP1 ● PAINT CHIP SAMPLING LOCATION - CONFIRMED LBP
- LP1 ● PAINT CHIP SAMPLING LOCATION - CONFIRMED LPB/MBP
- DENOTES AREA OF CONFIRMED ACM FLOOR TILE
- DENOTES ACM TAR PAPER OVER DUCT
- DENOTES ACM TANK INSULATION
- DENOTES ASBESTOS CONTAINING MATERIAL
- DENOTES LEAD BASED PAINT
- DENOTES MERCURY BASED PAINT

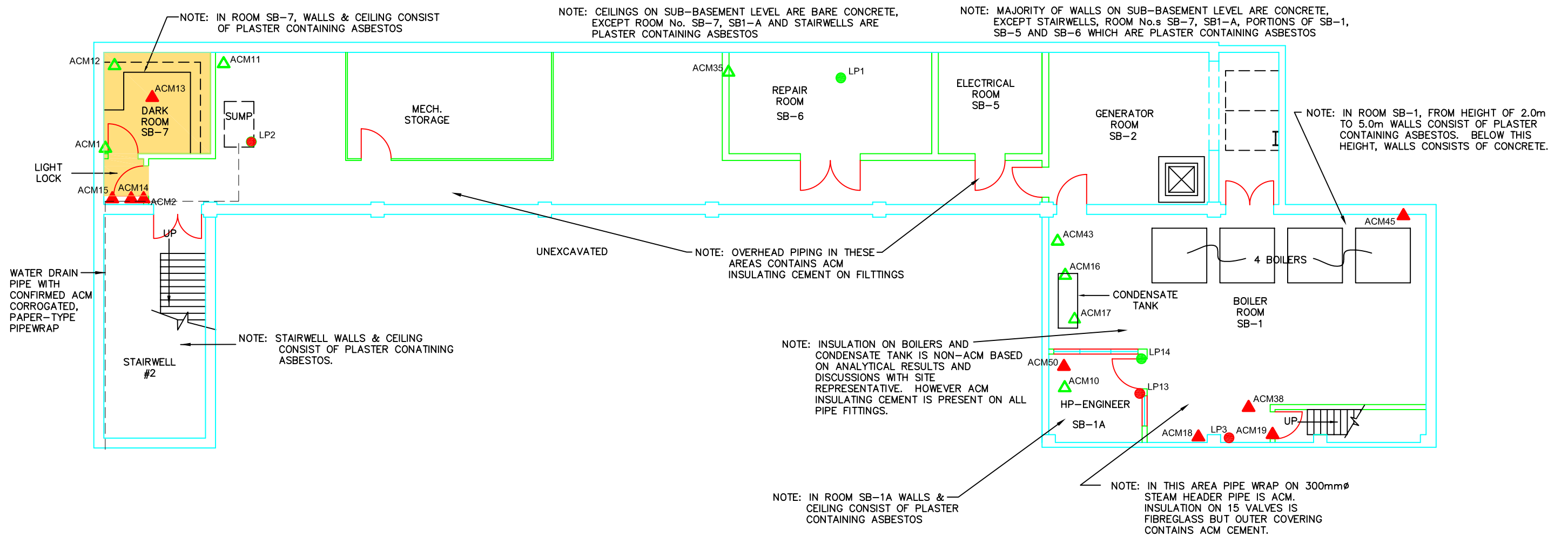
BASEMENT PLAN

SCALE: 1:125



FIGURE 3
SUSPECTED ACM AND LBP/MBP
SAMPLING LOCATIONS
BASEMENT PLAN
AGRICULTURE AND AGRI-FOODS CANADA BUILDING 25
MOUNT PEARL, NL

NOTE: DIGITAL DRAWINGS PROVIDED BY PWGSC.
ORIGINAL DRAWINGS WERE EDITED FOR PURPOSES
OF BUILDING SURVEY AND ARE FOR REFERENCE ONLY



LEGEND

- ACM1 SUSPECTED ACM SAMPLE LOCATION - CONFIRMED NON-ACM
- ACM1 SUSPECTED ACM SAMPLE LOCATION - CONFIRMED ACM
- LP1 PAINT CHIP SAMPLING LOCATION - CONFIRMED NON-LBP
- LP1 PAINT CHIP SAMPLING LOCATION - CONFIRMED LBP
- DENOTES AREA OF CONFIRMED ACM FLOOR TILE

SUB-BASEMENT PLAN

SCALE: 1:125



FIGURE 4
SUSPECTED ACM AND LBP/MBP
SAMPLING LOCATIONS

SUB-BASEMENT PLAN
 AGRICULTURE AND AGRI-FOODS CANADA BUILDING 25
 MOUNT PEARL, NL

NOTE: DIGITAL DRAWINGS PROVIDED BY PWGSC.
 ORIGINAL DRAWINGS WERE EDITED FOR PURPOSES
 OF BUILDING SURVEY AND ARE FOR REFERENCE ONLY

APPENDIX B

**LABORATORY CERTIFICATES
FOR PREVIOUS PLEL
ASBESTOS SAMPLING 1995 - 2004**

Pinchin LeBlanc
ENVIRONMENTAL LTD.

682 9812
Paul's document
754 4490

**ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT
BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING**

PROJECT NAME: Agriculture Canada
PROJECT NO.: 02-151
LAB REFERENCE NO.: Db0574-1995
DATE: April 7, 1995

Two bulk samples were submitted for determination of their asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 600/R-93/116 dated July, 1993. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of two analyses were performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three years. Samples may be retrieved, upon request, for re-examination at any time during that period.

Pinchin LeBlanc Environmental Ltd. is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP) for selected test methods for the identification of asbestos in bulk samples.

This test report relates only to the items tested.

The results are presented in the attached table.

lkc

**PINCHIN LEBLANC
ENVIRONMENTAL LTD.**

PAROULIER COURT
500 PRINCE ALBERT ROAD
SUITE 110
BARTHAMOUNT, N.A.
R2Y 4T2

BULK SAMPLE ANALYSIS

PROJECT NAME: Agriculture Canada

LAB REFERENCE NO: D60574-1995

PREPARED FOR: Frank Ralph

DATE: April 7, 1995

Agriculture Canada

PAGE: 1 of 1

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)			COMMENTS
		ASBESTOS	OTHER		
02-151-001AC Lab Fume Hood, Elbow Cement	Homogeneous, grey, soft cementitious material.	Chrysotile 50-75%	Non-fibrous Material 25-50%		
02-151-002AC Lab Fume Hood, Cement Pipe, Straight	Homogeneous, grey, hard, cementitious material.	Chrysotile Crocidolite 10-25% 5-10%	Non-fibrous Material 50-75%		

ANALYST: *Harry Cough*

**ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT
BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING**

PROJECT NAME: Agriculture Canada Building
Brookfield Road, St. John's, Newfoundland

PROJECT NO.: 02-512

LAB REFERENCE NO.: Db0764-1996

DATE: January 12, 1996

One bulk sample was submitted for determination of asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 800/R-03/118 dated July, 1983. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of one analysis was performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three years. Samples may be retrieved, upon request, for re-examination at any time during that period.

Pinchin LeBlanc Environmental Ltd. is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP) for selected test methods for the identification of asbestos in bulk samples.

This test report relates only to the items tested.

The results are presented in the attached table.

NOTE:

This report may not be reproduced, except in full, without the written approval of the laboratory. The client may not use this report to state product endorsement by NVLAP.

PINCHIN LEBLANC
ENVIRONMENTAL LTD.

PARADISE DRIVE
 280 PRINCE ALBERT ROAD
 SUITE 100
 WASHINGTON, PA.
 15376

BULK SAMPLE ANALYSIS
PROJECT NAME: Agriculture Canada Building 02-512
 Brookfield Road, St. John's, NF.
PREPARED FOR: P. Staben
 Pinchin LeBlanc Environmental Ltd.

LAB REFERENCE NO: D60754-1996

DATE: January 12, 1996

PAGE: 1 of 1

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
02-512-003 Contents of Vacuum Bag	Brown Dust	None Detected	Cellulose 25-50% Hair 5-10% Synthetic Fibres 1-5% Glass Fibres 0.1-1% Non-fibrous Material 50-75%	

ANALYST: *Sally Crayle*

Pinchin LeBlanc

ENVIRONMENTAL LTD.

ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING

PROJECT NAME: Agriculture Canada Building
Brookfield Road

PROJECT NO.: 02-812

LAB REFERENCE NO.: Db0790-1996

DATE: March 12, 1996

One bulk sample was submitted for determination of asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 600/R-93/116 dated July, 1993. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of three analyses were performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three years. Samples may be retrieved, upon request, for re-examination at any time during that period.

Pinchin LeBlanc Environmental Ltd. is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP) for selected test methods for the identification of asbestos in bulk samples.

This test report relates only to the items tested.

The results are presented in the attached table.

NOTE: This report may not be reproduced, except in full, without the written approval of the laboratory. The client may not use this report to claim product endorsement by NVLAP.

BULK SAMPLE ANALYSIS

**PINSHIN LEBLANC
ENVIRONMENTAL LTD.**

FAIRBANKS COURT
200 STANISLAIS AVENUE
SUITE 100
BOSTON, MA
02118

PROJECT NAME: Agriculture Canada Building 02-512
Brookfield Road
PREPARED FOR: P. Staebert
Pinchin LeBlanc Environmental Ltd.

LAB REFERENCE NO: DR0760-1986
DATE: March 12, 1986
PAGE: 1 of 1

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
02612-100 Fibre Hood Exhaust Insulation, Elevator of Building	3 Phases: a) Homogeneous, black tar. b) Homogeneous, brown, fibrous material. c) Homogeneous, gold, fibrous material.	Chrysotile None Detected None Detected	5-10% Tar and Other Non- fibrous Material >75% Fibroglass >75% Non-fibrous Material 1-5% Glass Fibres >75%	This sample also contains a layer of cellulose fabric reinforcement.

ANALYST: *Patrick Coughlin*

Pinchin LeBlanc

ENVIRONMENTAL LTD.

ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING

PROJECT NAME: Agriculture and Agri Food Canada
PROJECT NO.: 02-630
LAB REFERENCE NO.: Db0970-1996
DATE: December 20, 1996

One bulk sample was submitted for determination of asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 600/R-93/116 dated July, 1993. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of one analysis was performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three years. Samples may be retrieved, upon request, for re-examination at any time during that period.

Pinchin LeBlanc Environmental Ltd. is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP) for selected test methods for the identification of asbestos in bulk samples.

This test report relates only to the items tested.

The results are presented in the attached table.

NOTE:

This report may not be reproduced, except in full, without the written approval of the laboratory. The client may not use this report to claim product endorsement by NVLAP.

BULK SAMPLE ANALYSIS

PROJECT NAME: Agriculture and Agri Food Canada 02-630

LAB REFERENCE NO: Db0970-1996

PREPARED FOR: Frank Ralph
Agriculture and Agri Food Canada

DATE: December 20, 1996

PAGE: 1 of 1

PINCHIN LEBLANC
ENVIRONMENTAL LTD.

PADDLER'S COVE
300 PRINCE ALBERT ROAD
SUITE 120
DAKEMOUTH, N.S.
B3B 1M2

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
Sample #1 Plaster Finish Coat	Homogeneous, white, hard, cementitious material.	None Detected	Non-fibrous Material > 75%	

ANALYST: *Jacky Cougulas*

PINCHIN LEBLANC
ENVIRONMENTAL LTD.

FAIRLARKS COVE
 240 PRINCE ALBERT ROAD
 SOUTH 126
 BARTHOLOMEW, N.S.
 B3B 0M2

PROJECT NAME: Agriculture and Agri Food Canada 02-630

PREPARED FOR: Frank Ralph
 Agriculture and Agri Food Canada

LAB REFERENCE NO: Db0970-1996

DATE: December 20, 1996

PAGE: 1 of 1

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
Sample #1 Plaster Finish Coat	Homogeneous, white, hard, cementitious material.	None Detected	Non-fibrous Material > 75%	

ANALYST: *Harby Couplars*

PINCHIN LEBLANC
ENVIRONMENTAL LTD.

FADLER'S COVE
 260 FRANK ALBERT ROAD
 SUITE 128
 BARTHAQUE, N.S.
 B3B 1M3

BULK SAMPLE ANALYSIS

PROJECT NAME: Agriculture Canada 02-832

LAB REFERENCE NO: Db1040-1997

PREPARED FOR: P. Staeben
 Pinchin LeBlanc Environmental Ltd.

DATE: March 21, 1997

PAGE: 1 of 2

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
02-832-001 Heating Line Elbow Cement, Room B7	Homogeneous, grey, soft, cementitious material.	Chrysotile 50-75%	Non-fibrous Material 25-50%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method, therefore the estimated percentage of asbestos in this sample should be treated as a minimum value only. A more reliable estimate of asbestos content may be obtained by analysis by Transmission Electron Microscopy (TEM).
02-832-002 9"x9", Floor Tile, Room B5	Homogeneous, green, consolidated material.	Chrysotile 1-5%	Non-fibrous Material >75%	
02-832-003 Wall Finish, Kitchen	Homogeneous, grey, hard, cementitious material.	Chrysotile 1-5%	Non-fibrous Material >75%	

ANALYST: *Hobby*

BULK SAMPLE ANALYSIS

PROJECT NAME: Agriculture Canada 02-832

LAB REFERENCE NO: Db1040-1997

PREPARED FOR: P. Staeben
Pinchin LeBlanc Environmental Ltd.

DATE: March 21, 1997

PAGE: 2 of 2

**PINCHIN LEBLANC
ENVIRONMENTAL LTD.**

7 ADDLER'S COWS
390 PRINCE ALBERT ROAD
SUITE 129
DARTMOUTH, N.S.
B3B 1J6

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
02-832-004 Wall Finish, Room B7	2 Phases: a) Homogeneous, white, hard, cementitious material.	None Detected	Non-fibrous Material > 75%	
	b) Homogeneous, light beige, hard, cementitious material.	Chrysotile < 0.1%	Non-fibrous Material > 75%	
	Homogeneous, beige, hard, cementitious material.	Chrysotile < 0.1%	Non-fibrous Material > 75%	
02-832-005 Wall Finish, Room B5				

ANALYST: *Patrick Long*



**ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT
BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING**

PROJECT NAME: Agriculture Canada
Bulk Asbestos

PROJECT NO.: 02-4230

LAB REFERENCE NO.: Db3612 - 2004

DATE: March 18, 2004

One sample was submitted for determination of its asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 600/R-93/116 dated July, 1993. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of two analyses were performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This test relates only to the items tested. The results are presented in the attached table.

BULK SAMPLE ANALYSIS

LAB REFERENCE No: Db3612 - 2004
DATE: March 18, 2004
PAGE: 1 of 1

PROJECT NAME: Agriculture Canada
Bulk Asbestos
02-4230
Quentin Cribb
Pinchin LeBlanc Env.

PREPARED FOR:

PINCHIN LEBLANC ENVIRONMENTAL LTD.

BURNSIDE INDUSTRIAL PARK
40 JOHN SAVAGE AVENUE
DARTMOUTH, N.S.
B3B 2E6

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
001 Lab 1-18, plaster on wall around column	2 phases: a) Homogenous, white, soft, cementitious material b) Homogenous, tan, granular, cementitious material	None detected Chrysotile	Non-fibrous material >75% Non-fibrous material >75%	

ANALYST: 



**ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT
BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING**

PROJECT NAME: Agriculture Canada
Bulk Asbestos

PROJECT NO.: 02-4230

LAB REFERENCE NO.: Db3591 - 2004

DATE: March 23, 2004

Three samples were submitted for determination of their asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 600/R-93/116 dated July, 1993. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of six analyses were performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This test relates only to the items tested. The results are presented in the attached table.

BULK SAMPLE ANALYSIS

PINCHIN LEBLANC ENVIRONMENTAL LTD.

PROJECT NAME: Agriculture Canada Bulk Asbestos
LAB REFERENCE No: Db3591 - 2004
DATE: March 23, 2004
PREPARED FOR: Quentin Cribb
 Pinchin LeBlanc Env.
02-4230
PAGE: 1 of 1

BURNSIDE INDUSTRIAL PARK
 40 JOHN SAVAGE AVENUE
 DARTMOUTH, N.S.
 B3B 2E6

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
001 Agriculture Canada soils lab 119, plaster ceiling	2 phases: a) Homogenous, white, soft, cementitious material b) Homogenous, tan, granular, cementitious material	None detected Chrysotile	Non-fibrous material >75% Non-fibrous material >75%	
002 Agriculture Canada lab 116, plaster on ceiling	2 phases: a) Homogenous, white, soft, cementitious material b) Homogenous, tan, granular, cementitious material	None detected Chrysotile	Non-fibrous material >75% Non-fibrous material >75%	
003 Agriculture Canada analytical lab I-20, plaster ceiling	2 phases: a) Homogenous, white, soft, cementitious material b) Homogenous, tan, granular, cementitious material	None detected Chrysotile	Non-fibrous material >75% Non-fibrous material >75%	

ANALYST: 

APPENDIX C

**RESULT TABLES
AND
LABORATORY CERTIFICATES**

TABLE C-1
Summary of ACM Survey
Agriculture and Agri-Foods Canada Building 25, Mount Pearl, NL

Sample #	Material Description	Location Room #	Photo #	Friable Y/N	Condition Good/Fair/poor/damaged	Asbestos Result Percent & Type	Estimated Quantity	Comment
ACM1	Cement, rubber baseboard molding	SB-7	--	N	Fair	ND	--	
ACM 2	Floor tile, 23x23 cm, green with white	SB-7	1	N	Good	5 % Chrysotile	See note (2)	
ACM 3	Floor tile, 30x30 cm, beige	B-2	--	N	Good	Trace Chrysotile	--	Present only in a portion of room.
ACM 4	Floor tile, 23x23 cm, white with black	B-4	--	N	Good	8 % Chrysotile	See note (2)	
ACM 5	Floor tile, 30x30 cm, green with white	B-9	--	N	Good	ND	--	Present only in a portion of room.
ACM 6	Floor tile, 23x23 cm, light green with white and dark green	1-19	--	N	Good	3 % Chrysotile	See note (2)	
ACM 7	Floor tile, 23x23 cm, light green with white	1-18	--	N	Good	8 % Chrysotile	See note (2)	
ACM 8	Floor tile, 23x23 cm, red with white	1-6	--	N	Good	12 % Chrysotile	See note (2)	
ACM 9	Floor tile, 23x23 cm, light brown with dark brown and white	B-2	--	N	Good	5 % Chrysotile 3 % Chrysotile (Duplicate)	See note (2)	Present only in a portion of room. Duplicate D1 collected.
ACM 10	Floor tile, 30x30 cm, green	SB-1A	--	N	Good	ND	--	
ACM 11	Pipe insulation, brown, wool-like	SB Hall	--	Y	Damaged	ND	--	Similar material observed at numerous wall cavities throughout building.
ACM 12	Ceiling plaster, white, cementitious, thin topcoat only	SB-7	--	Y	Damaged	ND	--	Small damaged area.
ACM 13	Fabric, ceiling light fixture	SB-7	2	N	Good	80 % Chrysotile	0.03 m ²	20 cm dia.
ACM 14	Pipe wrap insulation, corrugated, paper-type	SB-7	3	Y	Good	10 % Chrysotile	15 linear metres	10 cm dia. drain water pipe.
ACM 15	Insulating pipe cement, joint, white, cementitious	SB-7	4	Y	Good	70 % Chrysotile	See note (3)	
ACM 16	Tank insulation, white cementitious	SB-1	--	Y	Damaged	ND	--	Condensate tank. Measures 1.8 m x 0.9 m dia.
ACM 17	Pipe wrap insulation	SB-1	--	Y	Good	ND	--	
ACM 18	Insulating pipe cement elbow, white, cementitious	SB-1	5	Y	Good	75 % Chrysotile	See note (3)	
ACM 19	Pipe wrap insulation, white, fibrous	SB-1	6	Y	Poor	20 % Amosite	40 linear meters	Located on overhead, 300 mm dia. steam header pipe. Small damaged portion.
ACM 20	Pipe wrap insulation	B-26	--	Y	Good	ND	--	
ACM 21	Insulating pipe cement elbow, white cementitious	B-26	--	Y	Good	ND	--	
ACM 22	Tank insulation, white, cementitious	B-26	7	Y	Good	10 % Chrysotile, 30 % Amosite	13.6 m ² total	Two tanks (same material) measuring 2.2 m x 0.8 m dia.
ACM 23	Floor tile, 23x23 cm, brown with dark brown	1-4	--	N	Good	12 % Chrysotile	See note (2)	
ACM 24	Insulating pipe wrap	1-4	--	Y	Good	ND	--	Located behind metal heater cover
ACM 25	Insulating pipe cement elbow, white cementitious	1-4	8	Y	Good	75 % Chrysotile	See note (3)	Qty: 2 per heater

TABLE C-1 Cont'd
Summary of ACM Survey
Agriculture and Agri-Foods Canada Building 25, Mount Pearl, NL

Sample #	Material Description	Location Room #	Photo #	Friable Y/N	Condition Good/Fair/poor/damaged	Asbestos Result Percent & Type	Estimated Quantity	Comment
ACM 26	Concrete, underside of roof	1-4	--	N	Poor	ND	--	Somewhat damaged and chipped.
ACM 27	Floor tile, 23x23 cm, beige with green	1-7	--	N	Good	8 % Chrysotile	See note (2)	
ACM 28	Floor tile, 23x23 cm, white with brown	1-5	--	N	Good	3 % Chrysotile	See note (2)	
ACM 29	Ceiling tile, suspended, grey	1-5	--	Y	Good	ND	--	
ACM 30	Insulating pipe cement, paste on ends of wrap	1-10	9	Y	Good	80 % Chrysotile	See note (3)	Located behind metal heater cover. Elbow cement was removed here.
ACM 31	Tarry material, black	1-10	--	N	Good	ND	--	Located around piping and styrofoam of exterior wall.
ACM 32	Wall plaster, 2 layers white cementitious and grey granular	1-17	--	Y	Good	Trace Chrysotile	--	30 cm thick. Red brick behind plaster.
ACM 33	Brick mortar, exterior	Exterior	--	N	Good	ND	--	
ACM 34	Concrete, exterior, with white aggregate	Exterior	--	N	Good	ND	--	Exterior window sills and columns.
ACM 35	Concrete, wall	SB-6	--	N	Poor	ND	--	Small damaged portion
ACM 36	Dust, white, storage room floor	B-25	--	Y	Poor	Trace Actinolite	--	Likely originated from overhead pipe insulation
ACM 37	Tar paper, duct	B-25	10	N	Good	8 % Chrysotile 10 % Chrysotile (Duplicate)	6.25 m ² total	Two similar ducts Duplicate D-2 collected.
ACM 38	Insulating pipe cement, paste on ends of wrap	SB-1	11	Y	Good	75 % Chrysotile	See note (3)	Cement paste on ends of valve insulation which appears to be fiberglass.
ACM 39	Ceiling plaster, grey granular, with wire mesh	1-16	12,13	Y (1)	Damaged	2 % Chrysotile Trace Chrysotile (duplicate)	See note (4)	Duplicate D-3 collected.
ACM 40	Ceiling plaster, white cementitious (thin top coat)	1-16	--	Y	Damaged	ND ND (Duplicate)	--	Duplicate D-4 collected.
ACM 41	Gypsum board, white	1-16	--	N	Damaged	ND	--	
ACM 42	Wall plaster, white cementitious and grey granular	1-20	--	Y	Poor	ND	--	Small damaged area near pencil sharpener.
ACM 43	Insulation on overhead duct work	SB-1	--	Y	Good	ND	--	
ACM 44	Terrazzo flooring	Stairwell #2	--	N	Good	Trace Chrysotile	--	
ACM 45	Wall plaster, with wire mesh	SB-1	14	Y (1)	Damaged	2 % Chrysotile	See note (4)	
ACM 46	Cement, ceramic wall tile	B-19	--	N	Good	ND	--	
ACM 47	Ceiling plaster, walk-in freezer, with wire mesh	B-21	15	Y	Damaged	ND	--	

TABLE C-1 Cont'd
Summary of ACM Survey
Agriculture and Agri-Foods Canada Building 25, Mount Pearl, NL

Sample #	Material Description	Location Room #	Photo #	Friable Y/N	Condition Good/Fair/poor/damaged	Asbestos Result Percent & Type	Estimated Quantity	Comment
ACM 48	Wallboard, interior of fume hood	1-17	16	N	Good	25 % Chrysotile	15 m ² total	Three fume hoods on first floor contain asbestos wallboard.
ACM 49	Insulating pipe cement elbow, white cementitious	B-25	17	Y	Good	75 % Chrysotile	See note (3)	
ACM 50	Wall plaster, grey granular	SB-1A	18	Y (1)	Good	3 % Chrysotile	See note (4)	
ACM 51	Wall plaster, white cementitious and grey granular	B Level Hall	19	Y (1)	Fair	5 % Chrysotile	See note (4)	
ACM 52	Window caulking, white	B-10	--	N	Good	ND	--	

NOTES:

2. Although wall and ceiling plaster are considered non-friable in-situ, these plasters become friable during demolition, cutting or abrasion. As a result, wall and ceiling plasters should be treated as friable materials.
3. Total estimated quantity of 23 x 23 cm ACM floor tile throughout building is 570 m² (See Figures 2, 3 & 4 in Appendix A for locations).
4. Total number of insulating ACM cement pipe fittings (elbows, joints, pipe wrap ends) throughout building has been estimated at 560 (See Figures 2, 3 & 4 in Appendix A for general locations).
5. Total estimated quantity of ACM plaster walls and ceilings throughout building is 4000 m² (See Figures 2, 3 & 4 in Appendix A for general locations).

"ND" denotes no asbestos fibres detected.

"Trace" denotes asbestos fibre(s) detected, however below 1%.

Shaded cells denote "asbestos containing material".



AMEC Earth & Environmental
 133 Crosbie Rd., P.O. Box #13216
 St. John's NL
 A1B 4A5
 Attn.: John Krilow

Date: December 15, 2006
 File#: JB06-205
 W.O.#: TF61076144
 Project: AC Bldg 25 Hazmat
 Fax #: 709-722-7353
 Page: 1 of 10

Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %					%	
			Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	Nonfibrous Material			
2006B-Homogeneous	01127 ACM-01		---	---	---	2	---	---	---	1	---	---	---	97
2006B-Homogeneous	01128 ACM-02		5	---	---	1	---	---	---	3	---	---	---	91
2006B-Homogeneous	01129 ACM-03		trace	---	---	2	---	---	---	3	---	---	---	95
2006B-Homogeneous	01130 ACM-04		8	---	---	1	---	---	---	2	---	---	---	89
2006B-Homogeneous	01131 ACM-05		---	---	---	2	---	---	---	3	---	---	---	95

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AMEC Earth & Environmental
 133 Crosbie Rd., P.O. Box #13216
 St. John's NL.
 A1B 4A5
 Attn.: John Krilow

Date: December 15, 2006
 File#: JB06-205
 W.O.#: TF61076144
 Project: AC Bldg 25 Hazmat
 Fax #: 709-722-7353
 Page: 2 of 10

Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %					%	
			Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	Nonfibrous Material			
2006B-Homogeneous	01132 ACM-06		3	---	---	---	2	---	---	---	5	---	---	90
2006B-Homogeneous	01133 ACM-07		8	---	---	---	1	---	---	---	5	---	---	86
2006B-Homogeneous	01134 ACM-08		12	---	---	---	1	---	---	---	2	---	---	85
2006B-Homogeneous	01135 ACM-09		5	---	---	---	2	---	---	---	2	---	---	91
2006B-Homogeneous	01136 ACM-10		---	---	---	---	1	---	---	---	3	---	---	96

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 Attn.: John Krilow

Date: December 15, 2006
 File#: JB06-205
 W.O.#: TF61076144
 Project: AC Bldg 25 Hazmat
 Fax #: 709-722-7353
 Page: 3 of 10

Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %					%
			Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	Nonfibrous Material		
2006B- Homogeneous 01137	ACM-11		---	---	---	8	---	---	---	---	90	---	2
2006B- Homogeneous 01138	ACM-12		---	---	---	1	---	---	---	---	1	---	98
2006B- 2 Layer 01139	ACM-13		80	---	---	5	---	---	---	---	---	---	15
2006B- M.Layer 01140	ACM-14		10	---	---	75	---	---	---	---	10	---	5
2006B- 2 Layer 01141	ACM-15		70	---	---	5	---	---	---	---	15	---	10

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Re: Polarized Light Microscopy Results

	Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %					%
				Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	Nonfibrous Material		
2006B- Homogeneous	01142	ACM-16		---	---	---	15	25	---	---	5	5	55	
2006B- 3 Layer	01143	ACM-17		---	---	---	10	75	---	---	10	5	5	
2006B- 2 Layer	01144	ACM-18		75	---	---	5	---	---	---	10	10	10	
2006B- 3 Layer	01145	ACM-19		---	20	---	30	---	---	---	10	40	40	
2006B- 3 Layer	01146	ACM-20		---	---	---	10	70	---	---	15	5	5	

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Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %					%
			Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	Nonfibrous Material		
2006B- Homogeneous 01147	ACM-21		---	---	---	15	25	---	---	5	5	55	
2006B- 2 Layer 01148	ACM-22		10	30	---	25	5	---	---	5	5	25	
2006B- Homogeneous 01149	ACM-23		12	---	---	1	---	---	---	1	86		
2006B- 3 Layer 01150	ACM-24		---	---	---	5	75	---	---	15	5		
2006B- 2 Layer 01151	ACM-25		75	---	---	3	---	---	---	10	12		

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Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %					%	
			Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	Nonfibrous Material			
2006B-Homogeneous	01152	ACM-26	---	---	---	1	---	---	---	---	2	---	---	97
2006B-Homogeneous	01153	ACM-27	8	---	---	1	---	---	---	1	---	---	---	90
2006B-Homogeneous	01154	ACM-28	3	---	---	1	---	---	---	1	---	---	---	95
2006B-Homogeneous	01155	ACM-29	---	---	---	---	95	---	---	---	---	---	---	5
2006B-Homogeneous	01156	ACM-30	80	---	---	3	2	---	---	---	---	---	---	15

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Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %						
			Chrysotile	Amosite	Other Asbestos Fibres	actinolite trace	Other	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	%	
2006B-Homogeneous	01162 ACM-36		---	---	---	---	5	---	---	5	---	5	---	65
2006B-Homogeneous	01163 ACM-37		8	---	---	---	---	25	---	5	---	---	---	52
2006B-Homogeneous	01164 ACM-38		75	---	---	---	---	---	---	10	---	---	---	10
2006B-Homogeneous	01165 ACM-39		2	---	---	---	---	---	---	2	---	---	---	95
2006B-Homogeneous	01166 ACM-40		---	---	---	---	---	---	---	1	---	---	---	99

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Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %					Nonfibrous Material	
			Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	%			
2006B-Homogeneous 01167	ACM-41		---	---	---	---	25	---	---	---	5	---	---	70
2006B-Homogeneous 01168	ACM-42		---	---	---	---	20	---	---	---	8	---	---	72
2006B-Homogeneous 01169	ACM-D1		3	---	---	---	1	---	---	---	1	---	---	95
2006B-Homogeneous 01170	ACM-D2		10	---	---	---	5	---	25	---	5	---	---	55
2006B-Homogeneous 01171	ACM-D3		trace	---	---	---	3	1	---	---	2	---	---	94
2006B-Homogeneous 01172	ACM-D4		---	---	---	---	1	---	---	---	2	---	---	97

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Fax #: 709-722-7353
Page: 10 of 10

Re: Polarized Light Microscopy Results:

Bulk samples were analyzed using Polarized Light Microscopy and dispersion staining techniques. The analytical procedures are in accordance with NIOSH Method 9002.

The % composition of the asbestos forms and other materials identified are the subjective visual judgement of the analyst based on specialized training, experience and comparison to standard area projections. The limit of detection is <1% asbestos and the sample range is from 1 to 100% asbestos. Due to the subjectivity of the Method, the quoted % of asbestos detected is an estimate and no responsibility is assumed to the manner in which the results are used or interpreted.

Separate components (eg. layers) are described separately and are combined in proportion to their abundance with a single analysis provided for the sample.

Analyst _____
Authorized Signature _____

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Date: December 15, 2006
 File#: JB06-207
 W.O.#: TF61076144
 Project: PWGSC, Bldg 25 Hazmat
 Fax #: 709-722-7353
 Page: 2 of 3

Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %					NON-ASBESTOS FIBRES %						
			Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Non-Asbestos Fibres	Other	Nonfibrous Material			
2006B-Homogeneous 01179	ACM 48		25	---	---	1	---	---	---	---	1	---	---	73
2006B-Homogeneous 01180	ACM 49		75	---	---	3	---	---	---	---	15	---	---	7
2006B-Homogeneous 01181	ACM 50		3	---	---	1	---	---	---	---	1	---	---	95
2006B-Homogeneous 01182	ACM 51		5	---	---	2	---	---	---	---	3	---	---	90
2006B-Homogeneous 01183	ACM 52		---	---	---	2	---	---	---	---	1	---	---	97

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APPENDIX D

ASBESTOS BACKGROUND INFORMATION

Asbestos

The disturbance of ACMs is governed by guidelines and codes of practice contained in the Newfoundland and Labrador *Asbestos Abatement Regulations* (Nfld. Reg. 111/98) and the federal Public Works and Government Services Canada (PWGSC) Departmental Policy (i.e. DP:057). ACMs must be removed prior to any demolition or renovation that may potentially disturb the asbestos materials.

Asbestos is a family of naturally occurring fibrous silicates from two mineralogical groups:

- Serpentine, which include chrysotile (white asbestos). These fibres are pliable, curly and made of tiny individual fibrils. They are spiral in shape.
- Amphiboles, which include amosite (brown asbestos) and crocidolite (blue asbestos). These fibres are straight and needle like.

The qualities of asbestos that promoted its use in construction are as follows:

- Fire
- Tensile strength
- Durability
- Flexibility
- Resistance to heat, wear, corrosion

Asbestos is typically found in plaster, mechanical insulation, gaskets, thermal insulation on pipes, refractory material, roofing felts, floor tiles, ceiling tiles and parging, heat resistant panels, incandescent light fixture reflector plates, and any other material requiring a high degree of durability or thermal resistance. The common use of potential friable (breakable by hand) ACMs in construction ceased voluntarily in the mid 1970s; however, the spray application of asbestos-containing fireproofing was not prohibited until 1986.

Asbestos has many building applications, which include:

- Effective insulator against heat, cold, electricity and noise.
- Used as sprayed insulation and fireproofing materials in the period following the Second World War until the mid 1970s.
- Used as a thermal insulator in pipes, boilers and incandescent light reflectors.
- Structural steelwork fireproofing of high-rise buildings.
- Acoustical and decorative purposes in ceiling tiles and building walls.
- Durability in floor tiles, wall board, roof shingles and felts, gaskets, caulking, wall and ceiling plasters.

Asbestos is a health hazard only if it can get into the body through:

- Inhalation.
- Ingestion.
- Absorption.

The primary health related concern of the above list is asbestos inhalation. Respiratory diseases such as asbestosis (lung scarring) and cancers have been clinically linked to prolonged and heavy occupational exposure to airborne asbestos.

Health related concerns prompted the Ontario Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario (1981) to study and report on health effects of asbestos in buildings in the early 1980's. The conclusions of the Royal Commission report (Chapter 9) were that (Bold added to section to emphasize critical conclusions of the Royal Commission Report):

“The exposure of building occupants to asbestos fibres during normal building use is insignificant, whether as compared to the exposure of insulation workers in the past or as compared to the much lower exposures permitted by the Ontario workplace control limits. Studies of asbestos concentrations in building air have shown that many buildings containing asbestos insulation do not exhibit fibre levels exceeding those in the outdoor air or in buildings not insulated with asbestos. Even when building exhibits elevated asbestos fibre levels, these are still very low compared to current workplace control limits and are orders of magnitude below the levels to which workers were exposed in the past.”

“We will conclude that it is rarely necessary to take corrective action in buildings containing asbestos insulation in order to protect the general occupants of the buildings. **On the other hand, construction, demolition, renovation, maintenance and custodial workers in asbestos-containing buildings may be exposed to significant asbestos fibre levels and may, during their work, cause elevated fibre levels for nearby occupants. THE PROBLEM OF PROTECTING THESE WORKERS, AND OF PROTECTING OCCUPANTS FROM POSSIBLE FIBRE RELEASE AS A RESULT OF BUILDING WORK, IS THE REAL CHALLENGE THAT ASBESTOS INSULATION IN BUILDING PRESENTS.**”

Asbestos waste should be disposed of in a double sealed container, properly labeled and free of cuts, tears or punctures. The waste must be disposed of in a licensed waste facility, which has been properly notified of the presence of asbestos waste.

The transport of asbestos waste to the disposal site is covered by the federal “Transportation of Dangerous Goods Act”. Asbestos waste is to be handled by a licensed waste hauler.

APPENDIX 2

**CONTRACTOR NOTIFICATION, ACKNOWLEDGEMENT FORM
AND
ASBESTOS WORK RECORD**



CONTRACTOR NOTIFICATION AND ACKNOWLEDGEMENT NOTIFICATION ET CONSENTEMENT DE L'ENTREPRENEUR

Working with asbestos can be dangerous unless appropriate work practices and personal protective equipment are utilized. Inhaling asbestos fibres can cause various types of lung disease including cancer. Smoking increases the risk of lung cancer from asbestos exposure.

Le travail de l'amiante présente des dangers pour la santé des travailleurs, à moins que ceux-ci utilisent des méthodes de travail et un équipement de protection individuelle appropriés. L'inhalation de fibres d'amiante peut causer diverses maladies pulmonaires, dont le cancer du poumon. Le tabagisme aggrave le risque d'être atteint d'un cancer du poumon par suite d'une exposition à l'amiante.

PWGSC has identified the presence of various friable and nonfriable asbestos containing materials at:

TPSGC a décelé la présence de divers matériaux friables et non friables contenant de l'amiante à l'endroit suivant :

Address - Adresse

An asbestos inventory report showing the locations and amounts of these materials is available for viewing from:

On peut prendre connaissance d'un relevé indiquant les emplacements et les quantités de matériaux contenant de l'amiante auprès de :

Name - Nom	Location - Lieu	Telephone no. N° du téléphone

The PWGSC Asbestos Management Code of Practice applies to all maintenance and renovation work that may disturb asbestos materials. The disturbance of asbestos building materials may only be undertaken by contractors who have received training in asbestos-related precautions.

Le code de pratique de gestion de l'amiante de TPSGC s'applique à tous les travaux d'entretien ou de rénovation susceptibles d'exposer les travailleurs à des matériaux contenant de l'amiante. Seuls les entrepreneurs qui ont reçu une formation sur les précautions à prendre face à l'amiante peuvent être autorisés à entreprendre des travaux comportant une exposition à des matériaux contenant de l'amiante.

As a condition of our contract to provide services and materials to PWGSC, this company will not disturb asbestos-containing materials without prior notification to:

Aux termes du contrat de fourniture de services et de matériaux conclu entre TPSGC et l'entreprise soussignée, cette dernière s'est engagée à ne pas entreprendre de travaux entraînant une exposition à l'amiante sans en informer d'abord :

Name - Nom	Location - Lieu	Telephone no. N° du téléphone

This firm and the employees of this firm will follow all procedures as specified by the PWGSC Asbestos Management Code of Practice, while working in:

L'entreprise et son personnel sont tenus de respecter toutes les procédures prescrites par le Code de pratique de gestion de l'amiante de TPSGC, pendant toute la durée des travaux effectués à l'endroit suivant :

Address - Adresse

Company name - Nom de la compagnie		
Name - Nom	Title - Titre	
Signature		Date



ASBESTOS-RELATED WORK RECORD FICHE DE TRAVAIL - TRAVAUX COMPORTANT UNE EXPOSITION À L'AMIANTE

Room - Pièce	Description of work - Description du travail	
Date work requested Date de la demande d'exécution des travaux		
Manager in Charge of Worksite or Supervisor Chef de chantier ou surveillant		
Classification of work - Type de travaux <input type="checkbox"/> Type 2 Ceiling Entry Type 2 - Accès au vide de plafond		
<input type="checkbox"/> Type 2 Repair Type 2 - Réparation		
<input type="checkbox"/> Type 2 Insulation Removal Type 2 - Enlèvement de matériaux isolants		
<input type="checkbox"/> Type 2 Asbestos Clean-up Type 2 - Nettoyage d'amiante		
<input type="checkbox"/> Type 3 Removal Type 3 - Enlèvement d'amiante		
Start (date and time) - Début (date et heure)	Completion (date and time) - Fin (date et heure)	
Department (indicate PWGSC or if a Contractor indicate Company Name) Ministère (TPSGC ou, dans le cas de travaux confiés à un entrepreneur, raison sociale de l'entreprise)		Person in Charge - Personne responsable
Asbestos workers (Indicate all names in full. Please print) Travailleurs affectés au travail de l'amiante (inscrire leur nom au long en lettres moulées)		

Asbestos work record to be initiated by Manager in Charge of the Worksite or Supervisor.

Il incombe au chef du chantier ou au surveillant de voir à faire remplir la fiche de travail concernant des travaux comportant une exposition à l'amiante.

To be completed by the Person in Charge and submitted to the Manager in Charge of the Worksite or Supervisor, upon completion of the work.

Le contremaître remplit la fiche de travail et la remet au chef de chantier ou au surveillant à la fin des travaux.

A copy of this record shall be placed on each employee's employment file and a copy shall be forwarded to the Regional Asbestos Co-ordinator.

Un exemplaire de la fiche est versé au dossier de chaque employé et un exemplaire est transmis au coordonnateur régional des travaux d'amiante.

A separate record must be prepared for each Type 2 or Type 3 Work Order or Project.

Une fiche distincte doit être établie pour chaque demande d'exécution de travaux ou chaque projet de type 2 et de type 3.

APPENDIX 3

EXCERPTS FROM PWGSC AMP

**NOTE: Excerpts taken from the Public Works Government Services Canada document
DP 057 - Asbestos Management, 1997-12-03**

Annex C - Appendix 1 - Evaluation of Asbestos Containing Materials (ACM) and Recommendations for Control

1. Assessment of Condition

Spray Applied Fireproofing, Insulation and Texture Finishes

In evaluating the condition of ACM spray applied as fireproofing, thermal insulation or texture, decorative or acoustic finishes, the following criteria apply:

GOOD	Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the surveyor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.
POOR	Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the survey or reassessment form.

NOTE: FAIR condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of buildings with ACM, regardless of the reported condition.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breeching, ductwork, piping, tanks, equipment etc.) the following criteria are used:

GOOD	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.
FAIR	Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.
POOR	Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product.

2. Evaluation of Accessibility

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

ACCESS (A)	Areas of the building within reach (from floor level) of all building users. Includes areas such as gymnasiums, workshops, and storage areas where activities of the building users may result in disturbance of ACM not normally within reach from floor level.
ACCESS (B)	Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder. Includes: frequently entered pipe chases, tunnels and service areas or areas within reach from a fixed ladder or catwalk, i.e., tops of equipment, mezzanines.
ACCESS (C) EXPOSED	Areas of the building above 8'0" where use of a ladder is required to reach the ACM. Only refers to ACM materials that are exposed to view, from the floor or ladder, without removing or opening other building components such as ceiling tiles, or service access doors or hatches. Does not include infrequently accessed service areas of the building.
ACCESS (C) CONCEALED	Areas of the building which require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems. Includes rarely entered crawl spaces, attic spaces, etc. Observations are limited to the extent visible from the access points.
ACCESS (D)	Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall or equipment, etc., is required to reach the ACM. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine the materials in Access D.

3. ACM Debris

Debris from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as DEBRIS.

Debris from Damaged Non-Friable ACM

The presence of fallen ACM, from damaged non-friable ACM, is reported separately from the non-friable ACM source. Only fallen non-friable ACM, that has become friable, is reported as DEBRIS.

The identification of the exact location or presence of DEBRIS on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations. Workers are advised to be watchful for the presence of DEBRIS prior to accessing, or working in proximity to, mechanical insulation or above ceiling areas of buildings with ACM, regardless of the reported presence or absence of DEBRIS.

4. Action Matrix and Action Descriptions

The Asbestos Management Program requires the following responses:

- Immediate clean-up of DEBRIS that is likely to be disturbed;
- The removal, repair or enclosure of friable ACM in POOR or FAIR condition where continued deterioration will result in DEBRIS that is likely to be disturbed.

The following factors shall be considered in making site-specific recommendations for compliance with the regulation, and for the practical implementation of asbestos management:

3. ACM in POOR condition is not routinely repairable.

If an abatement action is necessary, removal is the recommended action (enclosure is a viable option in unusual circumstances).

4. Mechanical insulation in FAIR condition will be repaired or removed based on the following general recommendations, applied on a case by case basis.

Repair ACM mechanical insulation found in FAIR condition in ACCESS (B) or ACCESS (C) EXPOSED areas.

Remove ACM mechanical insulation found in FAIR condition in ACCESS (B) and ACCESS (C) EXPOSED areas, where future damage to the ACM is likely to occur.

5. ACM in GOOD condition present in ACCESS (A) can be managed by surveillance, as long as it is not disturbed by future renovation, maintenance or demolition. Proactive removal of the ACM in ACCESS (A) will be considered where damage is possible by ongoing occupant activity (accidental or intentional).
6. Non-friable or manufactured products are considered in the action matrix as follows:
 - Non-friable and manufactured products reported in POOR condition, or friable DEBRIS resulting from the deterioration of non-friable ACM, are treated as friable materials and the appropriate Action, depending on accessibility, is determined from the Action Matrix for friable ACM.
 - For non-friable or manufactured products reported in GOOD condition, Action 7 (surveillance) is recommended regardless of Accessibility.
7. Remove all ACM from a particular area where small quantities of asbestos are present and removal will negate the need for the use of the Asbestos Management Program in that area.

The Action Matrix provided below establishes the recommended asbestos control action. The ACTIONS are described in full following the matrix.

ACTION MATRIX TABLE				
FRIABLE ACM				
ACCESS	CONDITION			DEBRIS
	GOOD	FAIR	POOR	
(A)	ACTION 5/7 ¹	ACTION 5/6 ²	ACTION 3	ACTION 1
(B)	ACTION 7	ACTION 6/5 ³	ACTION 3	ACTION 1
(C) exposed	ACTION 7	ACTION 6	ACTION 4	ACTION 2
(C) concealed	ACTION 7	ACTION 7	ACTION 4	ACTION 2
(D)	ACTION 7	ACTION 7	ACTION 7	ACTION 7

¹If material in **ACCESS (A)/GOOD** condition is not removed **ACTION 7** is required.

²If material in **ACCESS (A)/FAIR** condition is not removed **ACTION 6** is required.

³Remove **ACM** in **ACCESS (B)/FAIR** condition if **ACM** is likely to be disturbed.

ACTION 1	Immediate Clean-up of Debris That is Likely to be Disturbed
	Restrict access that is likely to cause a disturbance of the ACM DEBRIS and clean up ACM DEBRIS immediately. Utilize correct asbestos procedures. This action is required for compliance with regulatory requirements. The surveyor should immediately notify the Regional Asbestos Coordinator of this condition.
ACTION 2	Entry Into Areas With ACM Debris - Type 2 Precautions
	At locations where ACM DEBRIS can be isolated in lieu of removal or cleaned up, use appropriate means to limit entry to the area. Restrict access to the area to persons utilizing Type 2 asbestos-work precautions. The precautions will be required until the ACM DEBRIS has been cleaned up, and the source of the DEBRIS has been stabilized or removed.
ACTION 3	ACM Removal Required for Compliance
	Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.
ACTION 4	Access into Areas Where ACM is Present and Likely to be Disturbed by Access - Type 2 Precautions
	Use Type 2 asbestos precautions when entry or access into an area is likely to disturb the ACM. ACTION 4 must be used until the ACM is removed (Use ACTION 1 or 2 if DEBRIS is present).
ACTION 5	Proactive ACM Removal
	Remove ACM in lieu of repair, or at locations where the presence of asbestos in GOOD condition is not desirable.
ACTION 6	ACM Repair

Repair ACM found in FAIR condition, and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material in GOOD condition and implement ACTION 7. If ACM is likely to be damaged or disturbed, during normal use of the area or room, implement ACTION 5.

ACTION 7 Routine Surveillance

Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precautions (Type 1, Type 2 or Type 3) during disturbance of the remaining ACM.

5. Assessment of Condition

Spray Applied Fireproofing, Insulation and Texture Finishes

In evaluating the condition of ACM spray applied as fireproofing, thermal insulation or texture, decorative or acoustic finishes, the following criteria apply:

GOOD Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the surveyor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

POOR Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the survey or reassessment form.

NOTE: FAIR condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of buildings with ACM, regardless of the reported condition.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breeching, ductwork, piping, tanks, equipment etc.) the following criteria are used:

GOOD	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.
FAIR	Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.
POOR	Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product.

6. Evaluation of Accessibility

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

ACCESS (A)	Areas of the building within reach (from floor level) of all building users. Includes areas such as gymnasiums, workshops, and storage areas where activities of the building users may result in disturbance of ACM not normally within reach from floor level.
ACCESS (B)	Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder. Includes: frequently entered pipe chases, tunnels and service areas or areas within reach from a fixed ladder or catwalk, i.e., tops of equipment, mezzanines.
ACCESS (C) EXPOSED	Areas of the building above 8'0" where use of a ladder is required to reach the ACM. Only refers to ACM materials that are exposed to view, from the floor or ladder, without removing or opening other building components such as ceiling tiles, or service access doors or hatches. Does not include infrequently accessed service areas of the building.
ACCESS (C) CONCEALED	Areas of the building which require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems. Includes rarely entered crawl spaces, attic spaces, etc. Observations are limited to the extent visible from the access points.

ACCESS (D)

Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall or equipment, etc., is required to reach the ACM. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine the materials in Access D.

7. ACM Debris

Debris from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as DEBRIS.

Debris from Damaged Non-Friable ACM

The presence of fallen ACM, from damaged non-friable ACM, is reported separately from the non-friable ACM source. Only fallen non-friable ACM, that has become friable, is reported as DEBRIS.

The identification of the exact location or presence of DEBRIS on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations. Workers are advised to be watchful for the presence of DEBRIS prior to accessing, or working in proximity to, mechanical insulation or above ceiling areas of buildings with ACM, regardless of the reported presence or absence of DEBRIS.

8. Action Matrix and Action Descriptions

The Asbestos Management Program requires the following responses:

- Immediate clean-up of DEBRIS that is likely to be disturbed;
- The removal, repair or enclosure of friable ACM in POOR or FAIR condition where continued deterioration will result in DEBRIS that is likely to be disturbed.

The following factors shall be considered in making site-specific recommendations for compliance with the regulation, and for the practical implementation of asbestos management:

3. ACM in POOR condition is not routinely repairable.

If an abatement action is necessary, removal is the recommended action (enclosure is a viable option in unusual circumstances).

4. Mechanical insulation in FAIR condition will be repaired or removed based on the following general recommendations, applied on a case by case basis.

Repair ACM mechanical insulation found in FAIR condition in ACCESS (B) or ACCESS (C) EXPOSED areas.

Remove ACM mechanical insulation found in FAIR condition in ACCESS (B) and

ACCESS (C) EXPOSED areas, where future damage to the ACM is likely to occur.

5. ACM in GOOD condition present in ACCESS (A) can be managed by surveillance, as long as it is not disturbed by future renovation, maintenance or demolition. Proactive removal of the ACM in ACCESS (A) will be considered where damage is possible by ongoing occupant activity (accidental or intentional).
6. Non-friable or manufactured products are considered in the action matrix as follows:
 - Non-friable and manufactured products reported in POOR condition, or friable DEBRIS resulting from the deterioration of non-friable ACM, are treated as friable materials and the appropriate Action, depending on accessibility, is determined from the Action Matrix for friable ACM.
 - For non-friable or manufactured products reported in GOOD condition, Action 7 (surveillance) is recommended regardless of Accessibility.
7. Remove all ACM from a particular area where small quantities of asbestos are present and removal will negate the need for the use of the Asbestos Management Program in that area.

The Action Matrix provided below establishes the recommended asbestos control action. The ACTIONS are described in full following the matrix.

ACTION MATRIX TABLE				
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¹If material in **ACCESS (A)/GOOD** condition is not removed **ACTION 7** is required.

²If material in **ACCESS (A)/FAIR** condition is not removed **ACTION 6** is required.

³Remove **ACM** in **ACCESS (B)/FAIR** condition if **ACM** is likely to be disturbed.

ACTION 1 Immediate Clean-up of Debris That is Likely to be Disturbed

Restrict access that is likely to cause a disturbance of the ACM DEBRIS and clean up ACM DEBRIS immediately. Utilize correct asbestos

procedures. This action is required for compliance with regulatory requirements. The surveyor should immediately notify the Regional Asbestos Coordinator of this condition.

ACTION 2 Entry Into Areas With ACM Debris - Type 2 Precautions

At locations where ACM DEBRIS can be isolated in lieu of removal or cleaned up, use appropriate means to limit entry to the area. Restrict access to the area to persons utilizing Type 2 asbestos-work precautions. The precautions will be required until the ACM DEBRIS has been cleaned up, and the source of the DEBRIS has been stabilized or removed.

ACTION 3 ACM Removal Required for Compliance

Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.

ACTION 4 Access into Areas Where ACM is Present and Likely to be Disturbed by Access - Type 2 Precautions

Use Type 2 asbestos precautions when entry or access into an area is likely to disturb the ACM. ACTION 4 must be used until the ACM is removed (Use ACTION 1 or 2 if DEBRIS is present).

ACTION 5 Proactive ACM Removal

Remove ACM in lieu of repair, or at locations where the presence of asbestos in GOOD condition is not desirable.

ACTION 6 ACM Repair

Repair ACM found in FAIR condition, and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material in GOOD condition and implement ACTION 7. If ACM is likely to be damaged or disturbed, during normal use of the area or room, implement ACTION 5.

ACTION 7 Routine Surveillance

Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precautions (Type 1, Type 2 or Type 3) during disturbance of the remaining ACM.

9. Detection Limit of Bulk Analysis

Asbestos containing material, (ACM), is defined as any material found to contain asbestos at or above the limit for an asbestos containing material, (ACM), set provincially, as determined by the standard Polarized Light Microscopy method for the analysis of bulk samples. The provincially regulated limits, or generally accepted guidelines, to consider a material as an asbestos containing material, (ACM), subject to asbestos in buildings regulation, is provided as follows:

MINIMUM CONCENTRATION TO CONSIDER AS AN ASBESTOS CONTAINING MATERIAL (BY PROVINCE)	
PROVINCE/REGION	
NEWFOUNDLAND	1.0%
NOVA SCOTIA	
PRINCE EDWARD ISLAND	
NEW BRUNSWICK	
ALBERTA	
BRITISH COLUMBIA	
ONTARIO (includes part of National Capital Region)	0.5%
SASKATCHEWAN (no published concentration)	
QUEBEC (includes part of National Capital Region)	0.1%
MANITOBA	

Annex C - Appendix 5 - Classification of Asbestos-Related Work

The following criteria shall be utilized in determining the classification of asbestos work.

TYPE 1 WORK

- Installation or removal of a non-friable ACM with a hand tool.
- Disturbance of a non-friable ACM with a powered tool equipped with a HEPA dust collection device.
- Removal of drywall materials where joint filling materials contain asbestos.
- Removal or replacement of ten or less asbestos-containing compressed mineral fibre type ceiling tiles.
- Collecting samples of asbestos-suspect friable materials.
- Working close to friable sprayed asbestos, where the material may be affected by the work activities.

TYPE 2 WORK

- Removal or replacement of more than ten asbestos-containing compressed mineral fibre type ceiling tiles.
- Entry into ceiling spaces, crawlspaces, pipe tunnels, etc., where friable asbestos debris is present.
- In British Columbia, removal of drywall installed before 1980.
- Minor removal of friable ACM. Type 2 removal is limited to a maximum per work period of:
 - In British Columbia - 0.1 m² surface area, or 3 lineal metres of pipe insulation;
 - In Quebec - 0.03 m² of Debris;
 - All Others - 1 m² of surface area.
- Repair of asbestos mechanical insulation. (No limit is imposed as to the amount of repair permitted under Type 2 conditions.)

TYPE 3 WORK

- More than minor removal or disturbance of friable ACM.
- Use of a power tool on non-friable ACM without HEPA exhausted dust collection.
- The spray application of an encapsulant or sealer to friable asbestos surfacing materials.

- Disturbance of the ductwork and air handling equipment serving or passing through areas of buildings with sprayed asbestos fireproofing or insulation.
- Repair, alteration or demolition of a boiler, furnace, kiln, or similar equipment with asbestos-containing refractory.



Annex C - Appendix 6 - Work Procedures

TYPE 1 - Work Procedures

For locations of non-friable ACM, refer to the current version of the Asbestos Inventory and Assessment Report.

NOTE: These Type 1 procedures assume the non-friable material can be removed with relatively little loose dry dust released. Generation of debris is permissible as long as the debris can be well wetted before being removed. If the work will release more than a trivial amount of dry loose dust, do not proceed. The Regional Asbestos Coordinator will determine which of Type 1, 2 or 3 procedures are appropriate.

1. Equipment

All equipment must be on site before proceeding.

1. *Vacuum*

Use of a vacuum is optional. Wet cleaning methods may be used in place of a vacuum. If a vacuum is used it must be equipped with a high efficiency particulate (HEPA) filter and all brushes, fittings, etc. The vacuum must only be opened in an enclosure, following Type 2 procedures, or in a laboratory exhaust hood. The vacuum exterior should be carefully wet cleaned after emptying. A HEPA filter is at least 99.97% efficient in collecting a 0.3 micrometre particle.

2. *Respirators*

Use of a respirator is optional for Type 1 work. However, a respirator is strongly advised for work on sheet flooring, any type of ceiling tile, any other work performed overhead. Respirators shall be supplied by the employer upon request. The type of respirator supplied shall be a half-face respirator with HEPA filter. Training in the proper use of the respirator and qualitative fit testing shall also be provided. Respirators must be NIOSH approved and acceptable to the Provincial Authorities having jurisdiction. Respirators shall be used according to the written procedures for use, provided to the worker during training sessions. Filters must be changed after 24 hours of wear, or sooner if breathing resistance increases.

NOTE: Employees are required to undertake a medical evaluation as specified by DP 059 - Health Evaluations - Safety and Health, PWGSC prior to being trained in the proper use of respirators.

3. *Protective Clothing*

Reusable or disposable clothing may be used. Non-disposable clothing with visible asbestos contamination shall be cleaned with a HEPA vacuum and laundered as asbestos contaminated. Disposable clothing and respirator filters will be disposed of as asbestos

waste.

4. *Other Equipment*

- plastic sheet (0.15 mm (6 mil) polyethylene) - to serve as a drop sheet;
- pump sprayer with mister nozzle, or alternate method to wet material;
- labelled, yellow asbestos waste bags, 0.15 mm (6 mil) - for all asbestos waste, disposable equipment, plastic, etc.;
- small tools and cleaning supplies - e.g., scouring pads, sponges, brushes, buckets, etc.

2. **Other Protective Measures**

1. Do not eat, drink or smoke in the work area.
2. On leaving work area, proceed to washroom and wash all exposed skin on hands and face.

3. **Preparation**

1. Before disturbing non-friable asbestos materials, (wherever practical) cover floor and surfaces below work with polyethylene sheeting to catch debris.
2. Wherever dust on a surface is likely to be disturbed, remove with HEPA vacuum or damp cloth.

4. **Execution**

1. Removal of Vinyl Asbestos Floor Tile
 1. Do not use electric powered scrapers.
 2. Start removal by wedging a heavy duty scraper in seam of two adjoining tiles and gradually force edge of one tile up and away from floor. Do not break off pieces of tile, but continue to force balance of tile up.
 3. Continue removal of tiles using hand tools, removing tiles intact wherever possible. When adhesive is spread heavily or is quite hard, it may prove easier to force scraper through tightly adhered areas by striking scraper handle with a hammer using blows of moderate force while maintaining scraper at 25° to 30° angle to floor. When this technique does not loosen tile, removal can be simplified by heating tile thoroughly with a hot air gun until heat penetrates through tile and softens the adhesive.
 4. As each tile is removed, place into asbestos waste receptor. Do not break into smaller pieces.
 5. After removal of a small area, scrape up adhesive remaining on floor with a hand scraper until only a thin smooth film remains. Where deposits are heavy or difficult to scrape, a hot air gun may be used. Deposit scrapings in the asbestos waste disposal bag. Do not dry scrape surface pieces of tile that remain adhered. Do not use powered electric scrapers.
 6. On completion of the area, vacuum clean floor with HEPA vacuum or wet mop. Dispose of the mop head as contaminated waste.
2. Removal of Asbestos-Containing Sheet Flooring
 1. Remove binding strips or other restrictive mouldings. Workers shall wear air purifying respirator fitted with high efficiency filter, and coveralls, at all times.
 2. Make series of cuts 100 mm to 200 mm (4" to 8") apart through top layers and

about halfway through felt backing, parallel to wall.

3. Start at end of room furthest from door and pry up corner of strip, separating top sheet from backing layer. Pull top layer back upon itself slowly and evenly, and half backing and top layers should pull free. After it is removed, roll up strip face out into tight roll, tape or tie securely, and place into asbestos waste receptor. Wet the asbestos felt underlay remaining on floor as soon as exposed.
4. Continue with successive strips. Avoid walking on exposed asbestos felt. Seal asbestos waste receptors when filled. Remove maximum of three strips before wet scraping exposed felt underlay.
5. Remove remaining adhered underlay by wet scraping. Soak area with water applied by sprayer. Allow water to penetrate felt. Scrape off remaining material. Maintain material wet by applying more water. Place scrapings in asbestos waste receptor.
6. Continue this procedure alternately removing top sheets and then wet scraping felt, three strips at a time. Be careful not to walk on stripped floor.
7. When whole floor has been cleaned of asbestos felt, allow it to dry and vacuum up any dirt with a HEPA vacuum or wet mop. Do *not* dry sweep. Dispose of the mop head as contaminated waste.
8. Thoroughly clean tools and equipment with a damp cloth before returning to regular service. Dispose of cloth as contaminated waste.

3. Installing, Cutting or Drilling Non-Friable Asbestos Materials

1. Work using power tools not fitted with HEPA filter dust collectors, must not be performed as Type 1 work.
2. Where possible wet all materials to be disturbed.
3. Immediately place waste in asbestos waste receptor. Clean area frequently during work with HEPA vacuum or by wet methods.
4. At completion of work, drop sheets that will be reused must be cleaned with HEPA vacuum or by wet methods.
5. Drop sheets that will not be reused must be disposed of as asbestos waste.

4. Removal of Other Non-Friable Asbestos Materials

1. Type 1 procedures apply only to materials which can be removed intact, or in sections, without producing a pulverized or powdered waste. This method is most applicable to asbestos-cement board products, acoustic ceiling tiles, gaskets, etc.
2. Where possible wet all material to be disturbed.
3. Undo fasteners necessary to remove material. Whenever possible remove asbestos cement panels intact. Break only if unavoidable. If broken, wet freshly exposed edges.
4. Where sections are adhered to the substrate, wet material and use hand scraping to remove adhering material.
5. Place removed material into asbestos waste receptor. Clean surrounding surfaces and asbestos work area frequently with HEPA vacuum or with wet methods (i.e., damp cloth that is disposed of as asbestos waste after cleaning).
6. Drop sheets shall be disposed of as asbestos waste.

5. Waste Transport and Disposal

1. Place waste into asbestos labelled disposal bag, seal with tape, clean the exterior of the bag with a clean cloth, and place into a second clean bag, also to be sealed with tape. Use a barrel, fibre drum, or cardboard or wooden box in place of the second bag when the asbestos waste material is likely to tear the inner bag. Seal the outer container.

2. Place waste containers in storage area for holding asbestos waste. Containers shall be labelled and assigned exclusively for asbestos waste.
3. Prepare waste for disposal in compliance with provincial regulations. The Property Manager will arrange for disposal.

TYPE 2 - Work Procedures

For locations of asbestos materials, refer to the current version of the Asbestos Inventory and Assessment Report.

1. Equipment

Equipment required for the work must be on-site before proceeding.

1. Vacuum

An asbestos-approved vacuum (HEPA filtered), equipped with brushes, fittings, etc. Vacuum must not be opened except by a fully protected worker within a Type 2 enclosure. The vacuum exterior shall be carefully wet cleaned after emptying. A HEPA filter is at least 99.97% efficient in collecting a 0.3 micrometre particle.

2. Respirators

Workers within the work area shall wear approved respirator. Respirators and filters will be provided by the employer, and individually assigned to workers. Respirator shall be a half-facepiece respirator with high efficiency filters. Respirators must be NIOSH approved and acceptable to the Provincial Authorities having jurisdiction. Respirators shall be kept in position throughout the entire time the worker is in the area of the work, from first disturbance of a ceiling tile or asbestos material, until the final cleaning of the area and bagging of waste is complete. Change filters after 24 hours of wear or sooner if breathing resistance increases.

3. Protective Clothing

All workers shall wear disposable coveralls with attached elasticized hood. Coveralls should be worn with the hood in place at all times. Coveralls may be vacuumed or wet wiped clean for reuse, for a maximum of 8 hours cumulative wear. Suit and head cover shall remain in place until worker leaves work area or the enclosure is dismantled. Boot covers or dedicated boots are recommended.

4. Other Equipment

- plastic sheet (0.15 mm (6 mil) polyethylene) - to erect a total enclosure or to serve as drop sheet;
- wood framing or clips to support polyethylene sheeting, as appropriate to work area;
- tape - to fasten plastic enclosure to ceiling or to tape drop sheet to floor; ¾" double-sided tape recommended for attaching polyethylene to T-bar ceiling;
- labelled asbestos waste bag 0.15 mm (6 mil) - for all asbestos waste, disposable suit, plastic for disposal, etc.;
- pump sprayer containing water with wetting agent to wet asbestos as necessary (dilute wetting agent as per manufacturer's recommendations);
- asbestos warning signs;
- cleaning supplies - e.g., scouring pads, sponges, brushes, buckets, etc.;
- insulation repair supplies (lagging compound, cloth, PVC covers);
- encapsulating sealer, for brush or airless spray application.

2. Other Protective Measures

1. Do not eat, drink or smoke in the work area.
2. On leaving work area, proceed to washroom and wash all exposed skin on hands and face.

3. Scheduling of Work

1. Schedule work when occupants are absent. If persons are present, do not start work.
2. If work above ceiling is required on an emergency basis, and the area is occupied, ensure that client department(s) advise occupants to vacate area until work is complete and clearance is given to return.

4. Preparation

1. Shut down ventilation systems to and from the work area. Seal over all ventilation openings, diffusers, grilles, etc., with plastic and tape.
2. Where practical, clear areas of movable furnishings or equipment. This should include anything that occupants may wish to use during work period. Any furnishings or equipment not removed shall be adequately covered and sealed using 0.15 mm (6 mil) polyethylene and tape. The intent of the protection is to provide an airtight envelope to protect the articles from airborne dust or splashed debris.
3. Post signs or barrier tape, appropriate to the work area, to indicate asbestos hazard and requirement for protective clothing for anyone entering the space.
4. For small rooms, cover walls with plastic such that the complete room becomes the work area. For larger rooms, erect enclosure of 0.15 mm (6 mil) polyethylene, of suitable dimensions to enclose the work area, and scaffolds and ladders required to gain access. If a suspended ceiling is present, the enclosure shall extend to the ceiling line. The enclosure shall be as airtight as conditions permit, and will include the provision of a double overlapping flap at the entrance. The floor of the work area shall be a layer of 0.15 mm (6 mil) polyethylene sealed to the plastic walls of the enclosure.
5. Don protective clothing and respirator prior to removing ceiling tile or disturbing pipe jacketing or sprayed fireproofing.

5. Execution

1. To remove fireproofing or texture plaster, saturate with amended water solution, using a pump sprayer. Do not remove the asbestos material until the material is thoroughly wetted to the substrate. Do not use water where electrical hazard exists.
2. To remove pipe insulation, first wet any area of damage, then carefully cut jacket. Keep insulation surface wetted by mist of water with wetting agent. Remove insulation in large sections and place immediately in disposal bag. After large pieces have been removed, saturate debris on mechanical equipment and clean all exposed surfaces with abrasive pads, sponges, cloths, etc.
3. To repair pipe insulation, use drop sheet under area of work to aid clean-up of any dislodged material. Plastic enclosure is not required. Mist any exposed insulation to wet surface and apply lagging paint and canvas or PVC jacketing as required.
4. For removal of suspended ceiling tiles (where asbestos debris is present on top of tiles or equipment to be accessed), remove the first tile carefully and vacuum all surfaces. Vacuum the upper surface of each subsequent tile prior to removal. Store tiles in the work area.
5. Remove dust and loose friable material likely to be disturbed in the process of doing the work, with a HEPA vacuum or by damp wiping.
6. When asbestos material is removed, all pieces should be placed directly into 0.15 mm (6 mil) polyethylene bags as they are removed. Avoid dropping material to floor wherever

- possible. After bulk removal is complete, wet wash the exposed surface.
7. Frequently, and at regular intervals during the work, clean up dust and waste in the work area by wet mopping, placing in disposal bags, or by HEPA vacuuming.
 8. After completion of removal, seal exposed ends of fireproofing, texture plaster, or mechanical insulation with heavy layer of encapsulating sealer. Apply sealer coat to surfaces from which asbestos material was removed.
 9. At completion of work, decontaminate equipment, tools and materials used in the work area by wet cleaning or HEPA vacuum.
 10. Dispose of drop sheets and enclosures by wetting the polyethylene, then folding into disposal bags. Do not reuse drop sheets or enclosures.
 11. Before leaving work area, decontaminate shoes and protective clothing by using HEPA vacuum or damp wiping. When protective clothing is to be disposed of, it shall be decontaminated as above and placed in labelled disposal bags. Workers shall vacuum all exposed skin, suit and respirator, and proceed to nearest washroom to wash hands and face.

6. Waste Transport and Disposal

1. Place waste into asbestos labelled disposal bag, seal with tape, clean the bag, and place into a second clean bag, also to be sealed with tape. Use a barrel, fibre drum, or cardboard or wooden box in place of the second bag when the asbestos waste material is likely to tear the inner bag. Seal the rigid outer container.
2. Place waste containers in storage area for holding asbestos waste. Containers shall be labelled and assigned exclusively for asbestos waste.
3. Prepare for waste disposal in compliance with provincial regulations. The Property Manager will arrange for disposal.

TYPE 3 - Work Procedures

Type 3 procedures are not included in the standard work procedures due to the requirement for the development of specific procedures for the site and for the particular circumstances.

Glove Bag Work Procedures

1. Equipment

All equipment must be on site before proceeding with the work. Note that these procedures are primarily based on the use of Safe-T-Strip polyvinyl chloride movable glove bags. (Only the Safe-T-Strip glove bag is permitted for use in Ontario.) If the single use polyethylene glove bags permitted in some other jurisdictions are used, it should be understood that they are for use at one location only, and cannot be moved or used elsewhere.

NOTE: If single use polyethelene glove bag is used Section 5 - Execution, shall be replaced by manufacturer's recommended procedures.

1. *Glove Bag*

Prefabricated, 0.25 mm (10 mil) minimum thickness polyvinyl-chloride bag with integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elasticized port. Bag shall be equipped with reversible double-pull double throw zipper on top. Bag must incorporate internal closure strip if it is to be removed from pipe for reuse elsewhere. Provide size and configuration appropriate for insulation to be removed. The bag must be disposed of once filled. Bag shall not be emptied and reused.

2. *Securing Straps*

Reusable nylon straps at least 25 mm (1") wide with metal buckle for sealing ends of bags

around pipe and/or insulation.

3. *Water Sprayer*

Garden reservoir type, low velocity, capable of producing mist or fine spray with water-containing wetting agent. Wetting agent shall be diluted as per manufacturer's recommendations.

4. *Respirators*

Workers using glove bag must wear approved respiratory protection. Respirators and filters must be provided by the employer, and individually assigned to workers. Respiratory protection must be equal to, or exceed, protection of half-face respirator with high efficiency filters. Respirators must be NIOSH approved and acceptable to the Provincial Authorities having jurisdiction. Respirators shall be kept in position from the time the worker is attaching bag to pipe until final cleaning of the pipe and bagging of waste is completed. Filters shall be changed after 24 hours of wear or sooner if breathing resistance increases.

5. *Protective Clothing*

Workers shall wear disposable coveralls with attached elasticized hood. Coveralls and hood shall remain in place until worker completes cleaning of pipe. Suit may be cleaned for reuse or disposed of as asbestos waste.

6. *Other Equipment*

- labelled asbestos waste bags 0.15 mm (6 mil) - for all asbestos waste in glove bag, disposable suit, cleaning materials, etc.;
- asbestos warning signs;
- wire saw - saw with flexible serrated wire blade and handles to allow use inside glove bag;
- knife with fully retractable blade for use inside glove bag;
- plastic sheet (4 mil polyethylene) to cover exposed or damaged section of pipe prior to attaching glove bag;
- tape-to fasten plastic to pipe if required;
- cleaning supplies e.g., scouring pads, sponges, brushes, buckets, etc.;
- HEPA vacuum, for evacuating air from bag prior to removing bag from pipe. A HEPA filter is at least 99.97% efficient in collecting a 0.3 micrometre particle.

2. **Other Protective Measures**

1. Do not eat, drink or smoke in the work area.
2. On completing clean-up of work area, use HEPA vacuum or wet cloth to clean hands, face, respirator and boots. Remove protective equipment and proceed to nearest washroom to wash all exposed skin on hands and face.

3. **Scheduling of Work**

1. Schedule work when occupants are absent. If persons are present, do not start work.

4. **Preparation**

1. Where practical, clear area below pipe of moveable furnishings or equipment. Provide scaffold as required to reach pipe.
2. Post an asbestos warning sign at all entrances to room in which the procedure is being used. If necessary use rope or tape barriers to separate work area.
3. Segregate the area of asbestos work, from other parts of the building required to remain in use by using polyethylene walls or barrier tape.
4. Shut off and seal all diffusers, vents and other openings to ventilation and exhaust systems in the room with polyethylene secured with tape.
5. Cover all items or equipment located in the designated work area with polyethylene when items or equipment cannot be cleaned in the case of a spill. Tape the polyethylene in place. The polyethylene should cover a width equal to the height of the pipe from the floor, with a minimum width of 3.6 m (12 feet), where required.
6. Seal all openings and voids in the vicinity of the glove bag operation with one layer of polyethylene secured with tape.
7. Check condition of pipe insulation where work will be performed. If the pipe insulation has minor isolated damage, mist surface and patch with tape. If damage is more extensive, wrap pipe with plastic and "candy stripe" it with duct tape first. If pipe insulation is severely damaged and cannot be simply repaired, glove bag is not appropriate. (Use Type 2 Procedures.)
8. Pre-clean with HEPA vacuum or wet methods any loose material on surface of pipe or any material on the floor. If significant amount of material is on floor, Type 2 procedures may be required for clean-up. (See Type 2 Procedures.)
9. Place necessary tools in bottom of glove bag.

5. Execution

1. Zip the bag onto the pipe and seal each end to the pipe with the securing straps. Do not pull the bag tightly to the ends - a small amount of slack allows better room to work within the bag. If a vertical bag is in use, ensure lower strap passes through plastic grommet and cloth tab on zipper.
2. Place hands into gloves and use necessary tools (wire saw, utility knife, wire cutters) to remove insulation from pipe. Arrange insulation in bottom of bag to obtain full capacity of bag. Roll metal jacketing carefully to minimize ripping or puncturing of the bag.
3. Insert nozzle of spray pump into bag through valve and wash pipe and interior of upper section of bag thoroughly. Use one hand to aid washing process. Wet surface of insulation in lower section of bag and any exposed ends of asbestos insulation remaining on pipe.
4. Prior to removing bag from the pipe, wash the top section of the bag and tools thoroughly. Insert nozzle of HEPA filtered vacuum into bag through the elasticized valve and evacuate air from bag. Seal the closure strip, remove the vacuum nozzle and straps, and remove the bag. Re-install and seal in new location before reopening closure.
5. If bag is to be moved along the same pipe, loosen securing straps, move bag, re-seal to pipe using double-pull zipper to pass hangers. Repeat insulation removal operation.
6. If during use the glove bag is ripped, cut or opened in any way, cease work and repair opening before continuing work. All spilled material must be cleaned up and removed with a HEPA vacuum or wet cleaning.
7. To remove bag after completion of insulation removal, thoroughly wash top section of bag and tools and seal internal zip-lock closure. Place tools in one glove, pull hand out inverted, twist to create a separate pouch, tape inside-out glove at two separate locations 1" apart to seal pouch. Remove inside-out glove and tools by cutting between the tape seals.
8. Place glove pouch and tools into the next clean glove bag to be used. Alternately, place the tool pouch into water bucket, open pouch underwater and clean tools, then allow to dry.
9. Prior to disposal of bag, evacuate the bag with a HEPA vacuum. Pull a 0.15 mm (6 mil) polyethylene bag over glove bag before removing from pipe. Remove securing straps. Unfasten zipper. Seal glove bag and seal 0.15 mm (6 mil) polyethylene bag.
10. After removal of bag ensure pipe is clean of all residue. If necessary, after removal of each section of asbestos, vacuum all surfaces of pipe, using HEPA filtered vacuum equipment,

- or wipe with wet cloth.
11. Seal all surfaces of freshly-exposed pipe with encapsulating sealer to tack-down any residual dust. Cover exposed ends of any remaining asbestos insulation with lagging cloth or tape.
 12. Before leaving work area, a worker shall decontaminate shoes and protective clothing by using HEPA vacuum or damp wiping. When protective clothing is to be disposed of, it shall be decontaminated as above and placed in labelled disposal bags. Workers shall vacuum all exposed skin, suit, respirator and hair (after removing hood) and proceed to nearest washroom to wash hands and face.

6. Waste Transport and Disposal

1. **Place waste containers in storage area for holding asbestos waste. Containers shall be labelled and assigned exclusively for asbestos waste.**
2. **Prepare waste for disposal in compliance with provincial regulations. The Property Manager will arrange for disposal.**

Asbestos Work Procedures

Emergency Asbestos Work Procedures

Emergency asbestos procedures shall be implemented when required in order to protect those undertaking the work, as well as to protect all others from, or limit exposure to, airborne asbestos. Procedures indicated shall be followed as closely as possible, in the event of an emergency situation. Procedures for asbestos work, required as an immediate response to floods, pipe breaks, ceiling collapses, or other emergencies that affect asbestos materials, are as follows:

1. Clear area of all occupants.
2. Construct enclosure around area if time permits.
3. Shut down ventilation system serving area.
4. Worker performing repair shall wear protective respirator and disposable suit. If normal work clothes are worn they must be disposed of if visibly contaminated.
5. Use drop sheet under work, if possible, to minimize clean-up.
6. Perform emergency repair with minimum disturbance of asbestos.
7. Obtain asbestos equipment and perform clean-up of visible material. Use HEPA filtered vacuum or wet cleaning. Dispose of all cleaning supplies as contaminated waste.
8. The worker should wipe off or vacuum disposable clothing and footwear. Proceed to washroom to wash face and hands.
9. Notify the Property Manager regarding the asbestos disturbance, before allowing unprotected persons to enter the area. The Property Manager will contact the Regional Asbestos Coordinator to determine if additional precautionary measures are to be implemented. The Regional Asbestos Coordinator will arrange for removal, clean-up or repair of the asbestos material.
10. The Regional Asbestos Coordinator shall investigate the extent of asbestos disturbance, will determine additional actions to be undertaken and will determine if a hazard investigation under the *Canada Occupational Safety and Health Regulation* is appropriate.

Bulk Sample Collection Procedures

1. Sample the material when the area is not in use. Only those persons needed for sampling should be present in the immediate area.
2. Spray the material with a light mist of water to prevent fibre release during sampling. Do not disturb the material any more than necessary.
3. Materials of different appearance should be sampled separately. Mechanical insulation must be sampled separately on all systems, tanks, vessels, etc. Sample both the straight sections of pre-formed insulation and the insulating cement typically present at elbows, fittings, etc. (unless

visually identified as fibreglass).

4. Collect the sample by penetrating the entire depth of the material, as the insulation may have been applied in more than one layer or covered with paint or other protective coating.
5. The use of a respirator is recommended for all sampling. Depending on the condition of the material, significant amounts of airborne fibres can be generated during sampling.
6. If pieces of material break off during sampling, the contaminated area must be cleaned up with a HEPA vacuum cleaner or by wet cleaning. Any debris generated must be placed in plastic bags, labelled, sealed and disposed of as asbestos waste.
7. Place samples in labelled plastic bags with a zip-lock closure or in sealed plastic vials. Samples shall be identified with the following information:
 - Sample Number;
 - Building;
 - Room Number;
 - Date of Sampling;
 - Name of Sampler;
 - Source of sample, e.g., Cold Water Pipe, Cold Water Fitting, etc.

8. Temporarily seal any openings created to collect the sample, (for example, with tape, paint or metal foil tape wrapped completely around the pipe). Advise the Property Manager or Regional Asbestos Coordinator.
9. Analysis must be performed by the Health Canada Laboratory or by a laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Contact the Regional Asbestos Coordinator for a list of acceptable laboratories.

Respirator Fitting, Inspection, Cleaning and Disinfecting

Notes for Air Purifying Half-Facepiece Respirators

WARNING: This respirator does not supply oxygen. It must not be used in or for: oxygen deficient atmospheres (less than 19.5%); poorly ventilated areas or enclosed spaces such as tanks or small rooms; abrasive blasting or firefighting; or for protection against contaminants excluded or not covered by the applicable Approval Label.

Respirators must be approved for protection against asbestos. Check for NIOSH certification.

1. Respirator Fitting

Persons required to wear respirators must first pass a qualitative fit-test administered according to the current version of CSA standard Z-94.4. The fit-test should be repeated yearly.

2. Inspection Items Prior to Each Use

1. Examine facepiece for:

- dirt;
- cracks, tears or holes;
- distortion and inflexibility;
- cracks or breaks in filter holders, worn threads and missing gaskets.

2. Examine head straps for:

- breaks or tears;
- loss of elasticity;
- broken or malfunctioning buckles and attachments.

3. Examine valves for:
 - detergent residue, dust or other material on valves or valve seats;
 - cracks, tears or distortion in the valve material;
 - missing or defective valves or valve covers.

4. Examine filter for:
 - proper filter for protection against asbestos (High Efficiency Particulate);
 - incorrect installation, loose connections, missing or worn gaskets or cross threading;
 - cracks or dents in filter housing.

5. Leak-checks:

Perform the following tests on each donning:

- *negative pressure test*: cover inlets to filters, breathe in and hold breath; respirator should be drawn to face for minimum of ten seconds (if not, check exhalation valve and fit);
- *positive pressure test*: cover exhalation valve cover and puff out slightly and hold breath; respirator should slightly pressurize and still hold seal (if not, check inhalation valves and fit).

3. Respirator Cleaning and Disinfecting

1. Remove filters and disassemble facepiece. Discard or repair defective parts.
2. Wash components in warm water (50°C - 60°C) with mild detergent, using a brush. Cleaning and disinfectant solutions are available from respirator manufacturers.
3. Thoroughly rinse components in clean, warm water.
4. Air dry or hand dry components with a clean, lint-free cloth.
5. Reassemble respirator and test to ensure that all components are working properly (see above). Be careful to check that valves are not lost in the cleaning.

4. Filter Cartridge Handling and Replacement

1. Filters can be reused until an increase in breathing resistance is noted. Under typical Type 2 conditions, filter cartridges should last a minimum of 24 hours. Inlet side of filter cartridge to be reused shall be sealed on the inlet side with tape for storage.
2. When no longer usable, filter cartridges will be sealed on the inlet side with tape, and disposed of as contaminated waste.

APPENDIX 4

ASBESTOS CONTAINING MATERIAL INSPECTION CHECKLIST

**ASBESTOS CONTAINING MATERIAL
INSPECTION CHECKLIST
AGRICULTURE and AGRI-FOODS CANADA BUILDING 25**

Date	Asbestos Contractor or Consultant, if retained (include name & address)	Facility Representative in Attendance	Location of ACMs	Friable or Non-Friable	Recommended Action

This table must be maintained on site.

APPENDIX 5

EXAMPLE FORMS FOR MAINTAINING LIST OF TRAINED EMPLOYEES

LIST OF TRAINED EMPLOYEES
Asbestos Awareness

AGRICULTURE and AGRI-FOODS CANADA BUILDING 25

Employee Name	Date of Training

APPENDIX 6
SITE PHOTOGRAPHS



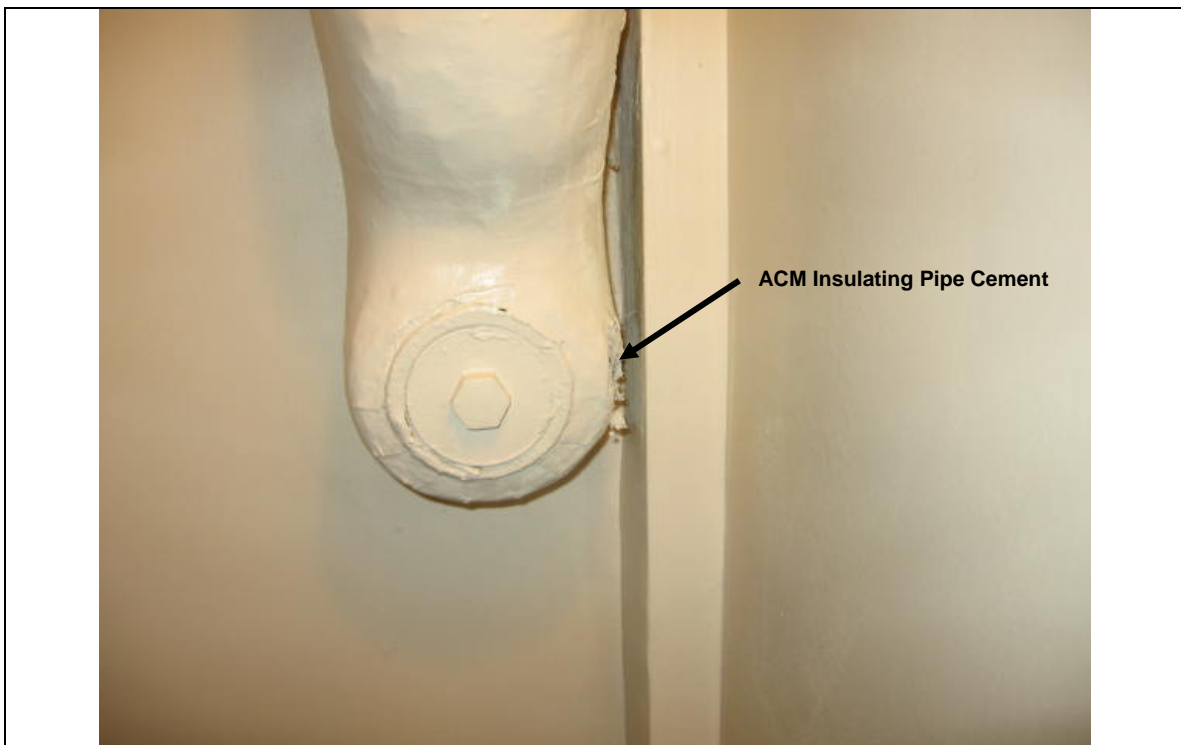
Photograph 1: Asbestos containing material (ACM), 23 x 23 cm, vinyl floor tile, Room No. SB-7 (Sample No. ACM 2). Note that eight other colours of ACM floor tile are also present in the building (no photos provided).



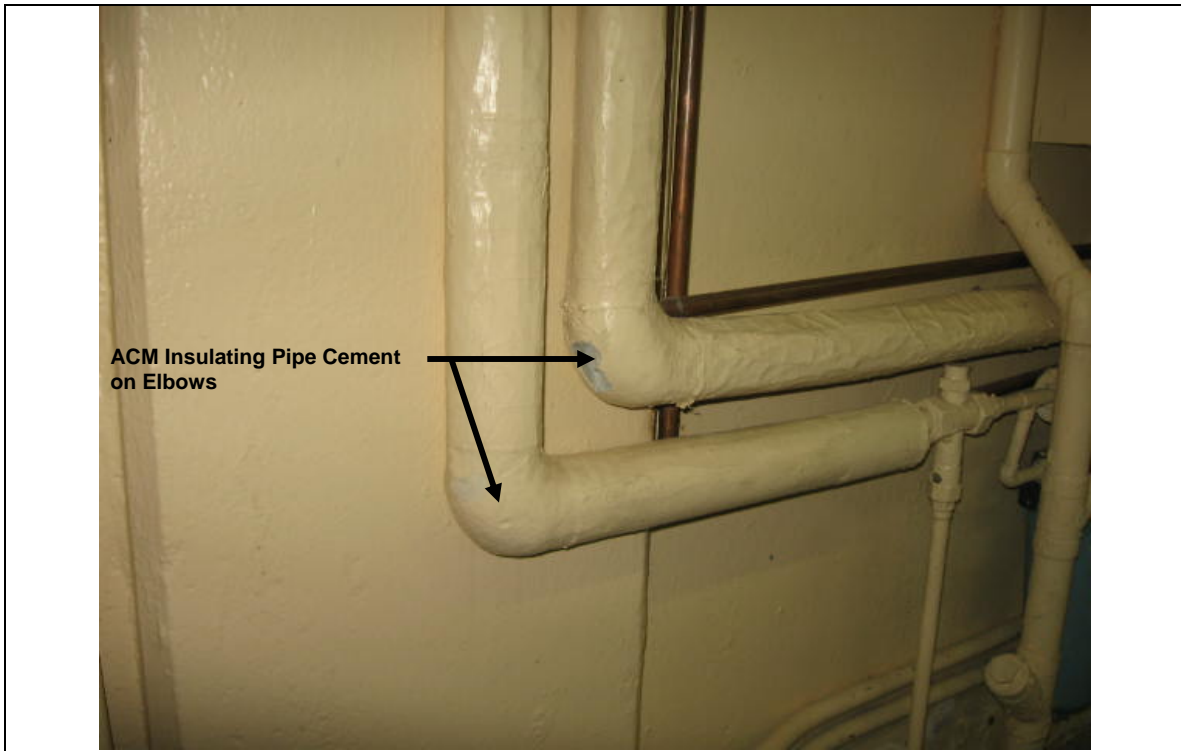
Photograph 2: ACM fabric on ceiling light fixture, Room No. SB-7. (Sample No. ACM 13)



Photograph 3: ACM pipe wrap insulation, corrugated paper-type, Room No. SB-7. (Sample No. ACM 14)



Photograph 4: ACM insulating pipe cement, Room No. SB-7. (Sample No. ACM 15)



Photograph 5: ACM insulating pipe cement (elbows), Room No. SB-1. (Sample No. ACM 18)



Photograph 6: ACM pipe insulation on overhead 300 mm dia. steam header piping. Room No. SB-1. (Sample No. ACM 19).



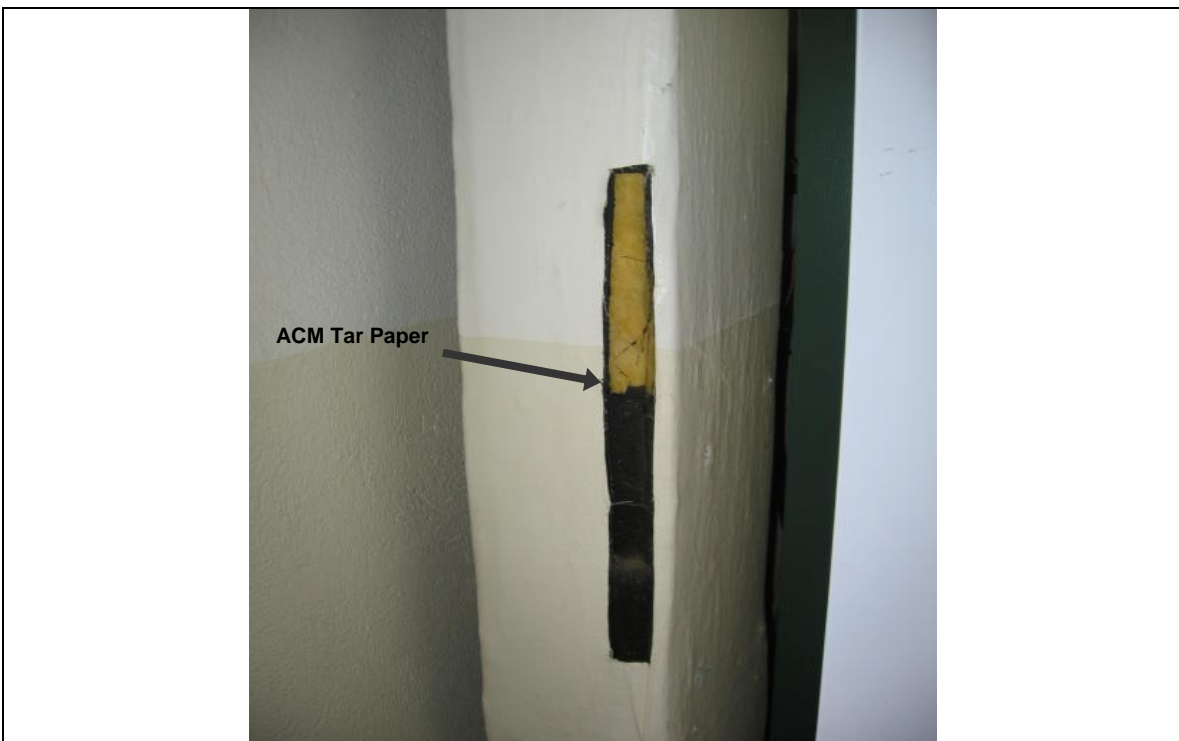
Photograph 7: ACM hot water tank insulation (2 tanks), Room No. B-2 (Sample No. ACM 22).



Photograph 8: ACM insulating pipe cement (elbow), located behind metal heater cover in Room No. 1-4. (Sample No. ACM 25).



Photograph 9: ACM cement on end of fiberglass pipe wrap in Room No. 1-10 (Sample No. ACM 30).



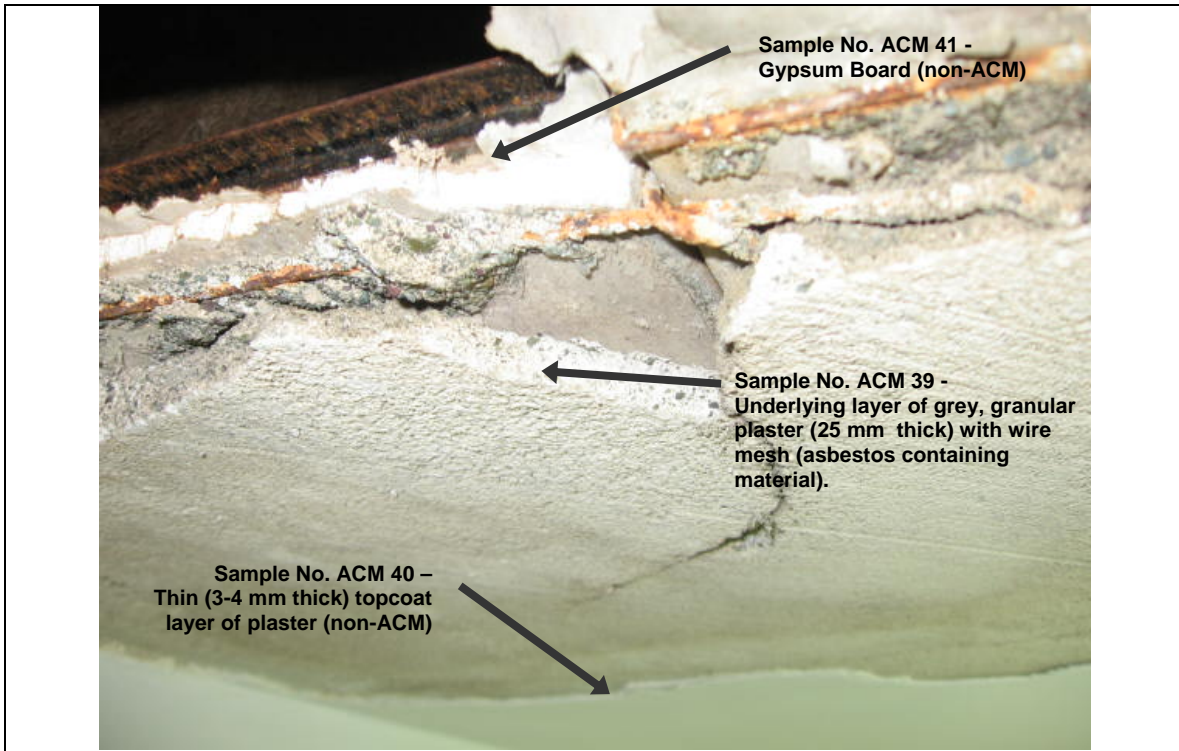
Photograph 10: ACM tar paper on duct (two) located in Room No. B-25. (Sample No. ACM 37)



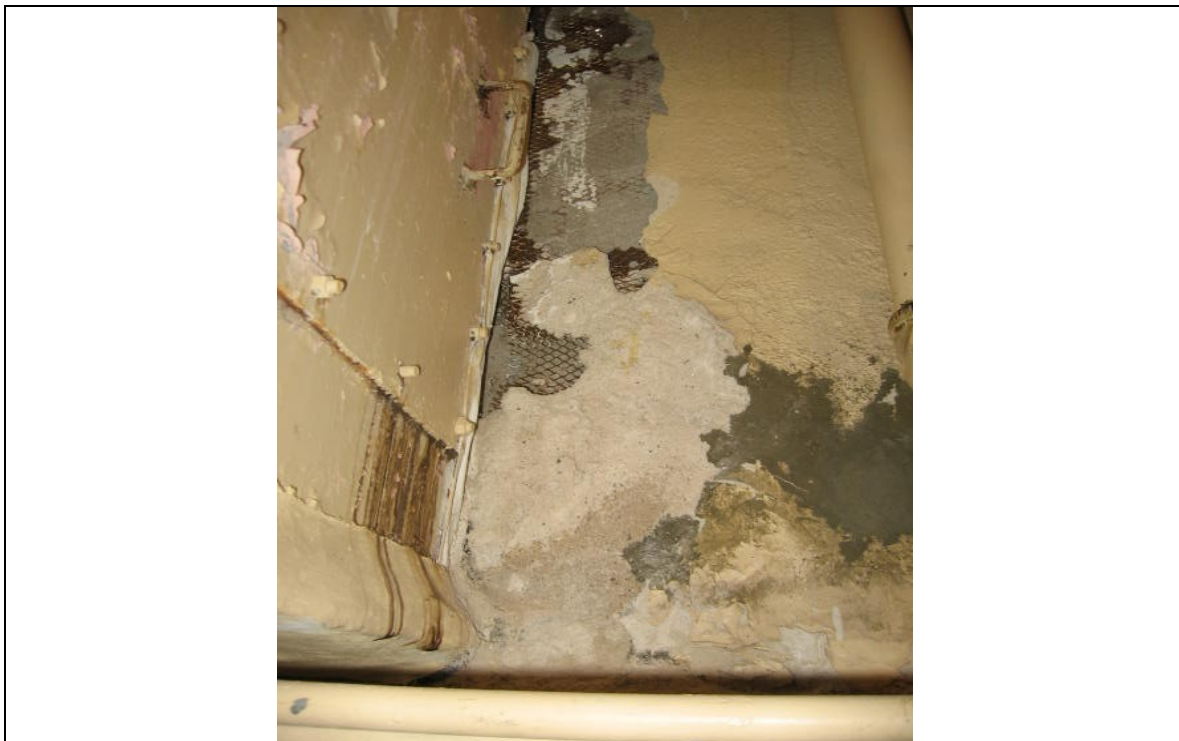
Photograph 11: ACM cement on end of fiberglass-insulated pipe valve. Room No. SB-1 (Sample No. ACM 38)



Photograph 12: Damaged ACM plaster ceiling, Room No. 1-16.



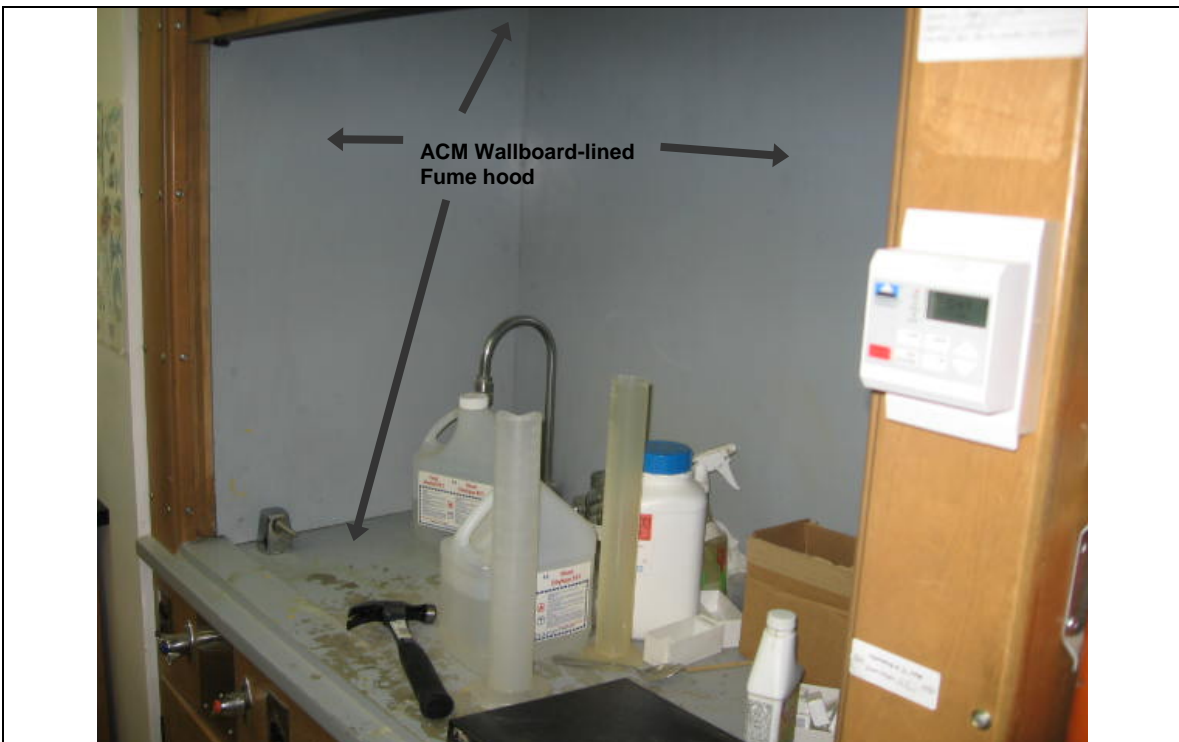
Photograph 13: Close-up of damaged ACM plaster ceiling in Room No. 1-16.



Photograph 14: Damaged ACM wall plaster, Room No. SB-1 (Sample No. 45)



Photograph 15: Damaged plaster ceiling in Room No. B-21 (Freezer Room). (Sample No. ACM 47). Note that although analysis of this material showed no asbestos was detected, material should be treated as asbestos based on positive results of similar samples and non-homogeneous nature of material.



Photograph 16: ACM wallboard-lined fume hood in Room No. 1-17. (Sample No. ACM 48). Note it was reported that there are two other fume hoods containing this wallboard material, however they are covered with stainless steel sheeting.



Photograph 17: ACM insulating pipe cement (elbow). Room No. B-25 (sample No. ACM 49)



Photograph 18: ACM wall plaster, Room No. SB-1A (Sample No. ACM 50).



Photograph 19: ACM wall plaster, end of B-level hall (Sample No. ACM 51)

APPENDIX 7

LIMITATIONS

LIMITATIONS

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
 - (a) The Standard Terms and Conditions which form a part of our Contract;
 - (b) The Scope of Services;
 - (c) Time and Budgetary limitations as described in our Contract; and,
 - (d) The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the site and attendant structures. Our conclusions cannot and are not extended to include those portions of the site or structures which were not reasonably available, in AMEC's opinion, for direct observation.
4. The environmental conditions at the site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the site with any applicable local, provincial or federal by-laws, orders-in-council, legislative enactments and regulations was not performed.
5. Where testing was performed it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, might be present on site and be revealed by different or other testing not provided for in our contract.
6. It should be noted that AMEC did not gain access to one room within the Building during the course of the Survey; namely, Room No. B-12 (locked vault).
7. The findings within this report do not reflect potential ACMs in areas not accessed, such as remote space areas, wall cavities and ceilings spaces. During future renovations or demolition activities and subsequent removal of interior wall and ceiling materials, the actual quantities of asbestos containing materials can be verified. Also at this time, analysis of suspect ACM materials may be required if the appearance differs from that of materials previously confirmed to contain asbestos in adjacent rooms.
8. Because of the limitations referred to above, different environmental conditions from those stated in our report might exist. Should such different conditions be encountered, AMEC must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
9. The utilization of AMEC's services during the implementation of any remedial measures will allow AMEC to observe compliance with the conclusions and recommendations contained in the report. AMEC's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.

10. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report, is the sole responsibility of such third party. AMEC accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
11. This report is not to be given over to any third party for any purpose whatsoever without the written permission of AMEC.

Asbestos Report

AAFC, Building 25

Dooley, Cherri

From: Dooley, Cherri
Sent: Thursday, April 02, 2009 11:50 PM
To: NL-StJohn-All Staff; Murphy, Peter
Cc: McKendry, Jim; Vallée, Louis
Subject: Asbestos
Importance: High

Good Evening,

Just an update following our asbestos information session presented by Sean Casey, Certified Industrial Hygienist which was held on Monday, March 30, 2009.

We are in the final stages of implementation of additional safety protocols established by Sean, these additions will be added to the report previously prepared by AMEC Earth & Environmental shortly. The report will be available for review to all staff upon request on Wednesday April 8, 2009. I will have several copies available for review.

The following website is a good resource for some background information relating to asbestos for those of you who had missed the information session.

<http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/asbestos-amiante-eng.php>

PLEASE NOTE:

- **Asbestos has been found and reported at the Atlantic Cool Climate Crop Research Centre, Building 25** and is located in the following areas:
 - mechanical insulation (piping, pipe fittings)
 - hot water tanks
 - flooring
 - ceilings (not to include ceiling tiles)
 - wall plaster finishing (not gyproc)
 - tar paper (duct insulation – located in sub basement)
- Although, asbestos was not present in all of the 52 samples taken from the areas above, as per the report any renovations or disturbances that may damage building material to include areas identified will be treated as Asbestos Containing Material (ACM) and the proper steps will be enforced to ensure the health of employees, contractors and visitors.
- Most ACMs in the Atlantic Cool Climate Research Facility – Building 25 are in good condition and do not pose a risk to human health.
- Asbestos only presents a health hazard when fibres become air borne and inhaled. The mere presence of ACMs does not represent a health hazard.

- Do not disturb the Asbestos Containing Materials. Activities that may disturb ACMs include cutting, drilling, sanding or removing the above mentioned building materials. Contact the Facility Asbestos Coordinator to make the necessary arrangements if you wish to undertake an activity that may disturb ACM.
- Report any evidence of disturbance or damage of ACMs to:
Frank Ralph, Facility Asbestos Coordinator
Telephone: 772-8863
Cell: 765-3760
Email: ralphf@agr.gc.ca
- Facility staff are taking special precautions during their work to guard against disturbing ACMs.
- Report any improper action (relative to ACMs) to the Facility Asbestos Coordinator, Frank Ralph.
- All ACMs and suspect ACMs are inspected periodically and additional measures will be taken if needed to protect the health of employees, contractors and visitors.

Thank you,

Cherri Dooley

Integrated Services Manager/ Gestionnaire des Services intégrés
Agriculture and Agri-Food Canada/Agriculture et Agroalimentaire Canada
Telephone/Téléphone: 709-772-4677
Facsimile/Télécopieur: 709-772-6064
308 Brookfield Road / 308 Ch Brookfield
P. O. Box 39088 / CP 39088
St. John's, NL A1E 5Y7
Dooleyca@agr.gc.ca

Dooley, Cherri

From: sonyacc@yahoo.com
Sent: Monday, March 23, 2009 4:07 PM
To: Dooley, Cherri
Subject: air sampling results



agcanasbsamples.xls (20 KB)

Please find enclosed the air sampling results for the sampling undertaken on March 11, 2009 at Building 25. (let me know if you can't read Maxxim Analytic's excel report)

2 background samples were taken as well as 1 where the plaster repairs were undertaken as follows:

Sample 1: SC-AG-01 background sample basement level from 5:55 pm to 6:58 pm. sampled at 16 litres per minute. Sample taken in hallway outside of office B-3. Air concentration was 0.018 fibres per cubic centimeter of air (note: provincial airborne limit is 0.1 f/cc & federal limit for chrysotile is 1 f/cc)

Sample 2: SC-AG-02 background sample 2nd level/main floor hallway outside M.P. Hannaford's office. Taken from 5:58 pm to 7:00 pm at 10 litres per minute. Air concentration was 0.011 f/cc.

Sample 3: SC-AG-03 taken during bubble repair from 6:58 pm to 7:58 pm. Flow rate of 16 litres per minute. Work vacininty was outside of B-3 and 6 plaster bubbles were repaired during the sampling period which took up about 3/4 of the sampling period. The sampling filter was approximately 6 feet away from the actual work zone on the boundary of where the poly was positioned and would represent the boundary of the restricted work zone. Air concentration was 0.020 f/cc.

The highest fibre count was 1/5th of the provincial permissible limit and 50 times less than the federal limit. Keep in mind as well that this fibre counting method counts all detectable fibres and not just those which are asbestos.

In any event, results are acceptable from a regulatory perspective. I can provide a more indepth report at a later date.

Sean

Maxxam Job #: A929002
Report Date: 2009/03/23

Sean Casey
Client Project #: SC-09-02
Project name: ST. JOHN'S
Sampler Initials:

RESULTS OF ANALYSES OF FILTER

Maxxam ID		BY6149		BY6150		BY6151		
Sampling Date		03-11-2009		03-11-2009		03-11-2009		
COC Number		23200		23200		23200		
	Units	SC-AG-01	RDL	SC-AG-02	RDL	SC-AG-03	RDL	QC Batch
Inorganics								
Asbestos	fibers/cc	0.018	0.003	0.011	0.004	0.020	0.003	1768928

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Date: March 26, 2009

Draft Procedure Submitted by: Sean Casey, CIH

Prepared for: Ms. Cherri Dooley,
Integrated Services Manager, Agriculture and Agri-Food Canada

Procedure Title: Cleanup dust from disturbance of ACM.

Cleanup debris and dust on surfaces after a small area of surfacing ACM has fallen from a ceiling, pipe insulation or other source

Summary:

This work practice is limited to the cleanup of a small quantity of relatively intact debris which has fallen from a plaster finish, or thermal insulation on pipes, boilers or other equipment.

Worker Recommendations:

This work activity can usually be carried out by one person trained as per the asbestos management plan.

Air monitoring:

Sampling may be required after cleanup depending on the situation. The worker shall consult with the Facility Asbestos coordinator to determine if follow-up clearance sampling is required prior to re-occupying the space.

Pre-Work Activities:

1. Review work procedure
2. Review any associated documentation as required in the asbestos management plan (ie. Completed Maintenance Work Authorization Form)
3. Obtain recommended tools, equipment and materials (see list at end of procedure)
4. Obtain ½ face, as a minimum, HEPA filtered respirator (worker must be fit tested and properly trained) and disposable tyvek coveralls, wet wipes
5. Barricade area using barrier tape or restrict access as stipulated by supervisor (ie. vacate area, lock doors) and conduct work at times designated by employer to reduce building occupant exposure to work zone. If barrier tape is used to denote

- a work area, it should be placed 5-10 ft outside of any poly protection used in the work area. Do not block access to any emergency exits.
6. Verify whether there are any exhaust vents in proximity to the proposed work area. Speak to your supervisor about whether these vents may need to be blocked or whether the ventilation system in the work zone can be effectively isolated as per company protocols.
 7. Put on tyvek and ½ face HEPA respirator and check for proper fit.
 8. Remove asbestos containing debris as follows:
 - a. start HEPA vacuum before entering the area
 - b. use the HEPA vacuum to clean a path at least 6 feet wide from the entry point of the work area to the site of the fallen material,
 - c. remove all small debris with the HEPA vacuum.
 - d. Remove any dust or loose debris from the surface of larger pieces of ACM with a HEPA vacuum. Mist surface of pieces with amended water.
 - e. Pick up such pieces (ie. Using inverted plastic bag) and place in the bottom of a 6 mil poly disposable asbestos bag. Place pieces in the bag without dropping and avoiding unnecessary disturbance and release of material. Thoroughly wet debris in bag with amended water as it is collected.
 - f. Remove all remaining visible debris with HEPA vacuum.
 - g. HEPA vacuum an area 3 feet beyond the location in which any visible debris was found. HEPA vac in 2 directions each at right angles to the other.
 - h. Wet wipes any hard surfaces or objects in the area which may have been contaminated.
 - i. Place a poly drop cloth down on top of the HEPA vacuumed area before performing repair work that may result in more fall out from above. If worker is required to work at heights and feels poly poses an unnecessary safety hazard, its use can be avoided if flooring is smooth and resilient enough to permit adequate cleaning afterwards.
 - j. HEPA vac the site from which material fell removing all loose material.
 - k. Repair or remove the remaining material as previously described.
 - l. HEPA vacuum ladder and/or any tools used and pass out of the work area.
 - m. Decontaminate objects/tools on the drop cloth. (HEPA vacuum followed by wet wiping). Then HEPA vacuum drop cloth before disposing as asbestos waste.
 9. Package and ensure asbestos waste is labelled for disposal.
 10. Barriers shall be discarded as asbestos waste unless they are rigid and easily cleanable.
 11. Workers decontaminate and remove protective clothing and respirators. Dispose of protective clothing as asbestos waste. Use wet wipes for gross cleaning and proceed to nearest washroom to wash up properly.
 12. Complete visual inspection.
 13. Restore normal accessibility to work area
 14. Complete documentation as required in the Asset Control Program.
 15. Transport waste to designated asbestos waste storage area
 16. Notify Asbestos program manager or supervisor that work is completed and return associated documents.

Tools, equipment and Materials:

- utility knife
- temporary work lights as required (GFCI)
- ladder or scaffold for elevated work
- wet wipes or bucket with clean water for wet wiping
- safety glasses and safety boots
- disposable coveralls
- ½ face respirator HEPA filtered as minimum
- Asbestos barrier tape and warning signs
- Polyethylene sheet
- Duct tape
- Asbestos disposal bags with labels
- HEPA vacuum with hose (attachments)
- Water spray with amended water(ie. Garden sprayer)

Date: February 25, 2009

Draft Procedure Submitted by: Sean Casey, CIH

Prepared for: Ms. Cherri Dooley,
Integrated Services Manager, Agriculture and Agri-Food Canada

Procedure Title: Repair Damaged Asbestos Containing Material (ACM) plaster

Summary:

This work practice covers the procedure for repairing small amounts (less than 1 sq metre) of damaged acoustical plaster. The procedure assumes that the damage is in isolated areas not greater in size than what will generate one standard asbestos disposal bag (filled one third full). It is anticipated that this work may disturb ACM, but not able permissible limits, and release of ACM, dust and debris is confined to the immediate location of the disturbance.

Examples:

1. Repair small hole in outer acoustical plaster ceiling or wall layer without intended disturbance of underlying asbestos layer.
2. Repair small area of delaminated acoustical plaster that it otherwise in good condition.

Worker Recommendations:

This work procedure only requires one worker to complete the task. The worker shall be trained as per the asbestos management plan. It is possible that there may be times when an additional worker may be need to hold the HEPA vacuum. In these circumstances the Facility Asbestos Coordinator shall be consulted.

Air monitoring:

Initial air sampling was carried out and it was verified that the safe work procedure can be carried out safely without containment in place. Additionally, there is no requirement for further air sampling also conditions change. The exposure assessment report is available in the asbestos management plan. Additional use of this procedure must conform to the requirements of this procedure. If job conditions vary from the examples and conditions stipulated, the work shall not proceed until workers check with the Facility Asbestos Coordinator.

Pre-Work Activities:

1. Review work procedure
2. Review any associated documentation as required in the asbestos management plan (i.e. Completed Maintenance Work Authorization Form)
3. Obtain recommended tools, equipment and materials (see list at end of procedure)
4. Obtain ½ face, as a minimum, HEPA filtered respirator (worker must be fit tested and properly trained) and disposable tyvek coveralls, wet wipes
5. Barricade area using barrier tape or restrict access as stipulated by supervisor (ie. Vacate area, lock doors) and conduct work at times designated by employer to reduce building occupant exposure to work zone. If barrier tape is used to denote a work area, it should be placed 5-10 ft outside of any poly protection used in the work area. Do not block access to any emergency exits.
6. A check shall be made to determine whether there are any exhaust vents in the area of the work zone, and if so, the worker shall inform their supervisor to determine what if any action is required (ie. block vent, shut down section of unit in question).
7. Ensure proper hygiene practices followed during work: no eating, drinking, chewing or smoking in asbestos work area

Work Practice: Always use wet methods, HEPA vacuums, prompt clean-up and disposal of waste. Prohibited practices include: dry clean-up of dust and debris, or use of compressed air or high speed abrasive saws. Perform work as per steps in work practice as follows:

8. Once personal protective equipment (PPE) in place and pre-work activities in place, pre-clean work area if visible dust or debris is present.
9. Put poly sheet directly below work area and far enough to catch any inadvertent falling debris. A single layer of poly is to be spread on the floor and taped or weighted in place. If work is to be performed at an elevated level, the poly should be placed on the platform and extended at ground level beyond the immediate work location. To catch any debris that might be generated. To reduce the likelihood of slips, non-slip footwear should be used. If worker is required to work at heights and feels poly poses an unnecessary safety hazard, its use can be avoided if flooring is smooth and resilient enough to permit adequate cleaning afterwards.
10. Place necessary tools (see list below) on poly drop sheet.
11. Mist any damaged surfacing using garden sprayer/mist bottle containing amended water and allow water to soak in for several minutes.
12. Within HEPA vacuum within several inches of damaged area, remove any loose material by hand or with scraper. Collect material in disposal (asbestos) bags as it is removed. Remove material around edges of damaged area until well-adhered material is found, but do not remove beyond area protected by drop cloth. Mist removal area during removal of damaged material.
13. Repair damaged area using non-ACM (such that no edges containing asbestos fibres are likely to become airborne) and perform clean-up as follows:

14. package and ensure asbestos waste is labelled for disposal.
15. Apply lockdown encapsulant only if asbestos surfaces remain exposed (however this should not be the case since asbestos is contained within underlying layer)
16. Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to designate area
17. Remove drop cloth and dispose of as asbestos waste. Barriers shall be discarded as asbestos waste unless they are rigid and easily cleanable.
18. Workers decontaminate and remove protective clothing and respirators. Dispose of protective clothing as asbestos waste.
19. Complete visual inspection.
20. Restore normal accessibility to work area
21. Complete documentation as required in the Asset Control Program.
22. transport waste to designated asbestos waste storage area
23. Notify Asbestos program manager or supervisor that work is completed and return associated documents.

Tools, equipment and Materials:

- utility knife
- temporary work lights as required (GFCI)
- ladder or scaffold for elevated work
- wet wipes or bucket with clean water for wet wiping
- safety glasses and safety boots
- disposable coveralls
- ½ face respirator HEPA filtered as minimum
- Asbestos barrier tape and warning signs
- Polyethylene sheet
- Duct tape
- Asbestos disposal bags with labels
- HEPA vacuum with hose (attachments)

Date: February 27, 2009

Draft Procedure Submitted by: Sean Casey, CIH

Prepared for: Ms. Cherri Dooley,
Integrated Services Manager, Agriculture and Agri-Food Canada

Procedure Title: Cut or drill hard cementitious asbestos-containing plaster in isolated areas for routine maintenance purposes

Summary: When drilling plaster most regulatory agencies require going beyond the use of impermeable drop clothes to include some form of isolation method. This work practice will rely on a HEPA exhausted collar on the drill, shaving cream, or a wet sponge as, "another isolation method". This will comply with both provincial and federal asbestos regulatory requirements. The employer must ensure that the work is done such that it effectively isolates the drilling or cutting work.

It is anticipated that this work may disturb ACM, but not above permissible limits, and release of ACM, dust and debris is confined to the immediate location of the disturbance.

Worker Recommendations:

This work activity can usually be carried out by one person trained as per the asbestos management plan.

Air Monitoring:

Air sampling is not considered necessary unless for some reason the use of wet sponges, shaving cream, etc, is unable to form an effective seal to prevent the release of fibres. In such circumstances the worker must check with the Facility Asbestos Coordinator prior to proceeding.

Pre-Work Activities:

1. Review work procedure
2. Review any associated documentation as required in the asbestos management plan (ie. Completed Maintenance Work Authorization Form)

3. Obtain recommended tools, equipment and materials (see list at end of procedure) including drill or hole saw (as needed) equipped with HEPA filtered dust collection
4. Obtain ½ face, as a minimum, HEPA filtered respirator (worker must be fit tested and properly trained) and disposable tyvek coveralls, wet wipes
5. Barricade area using barrier tape or restrict access as stipulated by supervisor (ie. vacate area, lock doors) and conduct work at times designated by employer to reduce building occupant exposure to work zone. If barrier tape is used to denote a work area, it should be placed 5-10 ft outside of any poly protection used in the work area. Do not block access to any emergency exits.
6. Verify whether there are any exhaust vents in proximity to the proposed work area. Speak to your supervisor about whether these vents may need to be blocked or whether the ventilation system in the work zone can be effectively isolated as per company protocols.
7. Ensure proper hygiene practices followed during work: no eating, drinking, chewing or smoking in asbestos work area

Work Practice:

Always use wet methods, HEPA vacuums, prompt clean-up and disposal of waste. Prohibited practices include: dry clean-up of dust and debris, or use of compressed air or high speed abrasive saws. Perform work as per steps in work practice as follows:

8. Once PPE in place and pre-work activities in place, pre-clean work area if visible dust or debris is present.
9. Put poly sheet directly below work area and far enough to catch any inadvertent falling debris. A single layer of poly is to be spread on the floor and taped or weighted in place. If work is to be performed at an elevated level, the poly should be placed on the platform and extended at ground level beyond the immediate work location to catch any debris that might be generated. To reduce the likelihood of slips, non-slip footwear should be used. If worker is required to work at heights and feels poly poses an unnecessary safety hazard, its use can be avoided if flooring is smooth and resilient enough to permit adequate cleaning afterwards.
10. Place necessary tools (see list below) on poly drop sheet.
11. Mist area to be cut or drilled. Holes can be drilled through a wet sponge or shaving cream on both sides or through use of HEPA filtered dust collection.
12. When finished with sponge it should be placed in asbestos disposal bag.
13. HEPA vacuum removal area and areas accessible from hole.
14. HEPA vacuum and wet wipe up any accessible dust or debris generated on back side. Remove drop cloth and place in disposal bags (asbestos type).
15. Perform maintenance work and clean-up as follows:
16. Package and ensure asbestos waste is labelled for disposal.
17. Apply lockdown encapsulant only if drill holes to remain exposed

18. Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to designate area
19. Remove drop cloth and dispose of as asbestos waste. Barriers shall be discarded as asbestos waste unless they are rigid and easily cleanable.
20. Workers decontaminate and remove protective clothing and respirators. Dispose of protective clothing as asbestos waste. Use wet wipes fro gross cleaning and proceed to nearest washroom to wash up properly.
21. Complete visual inspection.
22. Restore normal accessibility to work area
23. Complete documentation as required in the Asset Control Program.
24. Transport waste to designated asbestos waste storage area
25. Notify Asbestos program manager or supervisor that work is completed and return associated documents.

Tools, equipment and Materials:

- utility knife
- temporary work lights as required (GFCI)
- ladder or scaffold for elevated work
- wet wipes or bucket with clean water for wet wiping
- safety glasses and safety boots
- disposable coveralls
- ½ face respirator HEPA filtered as minimum
- Asbestos barrier tape and warning signs
- Polyethylene sheet
- Duct tape
- Asbestos disposal bags with labels
- HEPA vacuum with hose (attachments)
- Shaving cream/wet sponge



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

**ENTOMOLOGY LAB RETROFIT
BUILDING # 25
BROOKFIELD ROAD
ST. JOHN'S, NL**

DRAWING LIST

ARCHITECTURAL

A1-R0 GENERAL NOTES AND KEY PLAN
A2-R0 EXISTING/DEMOLITION/NEW LEVEL 1 PARTIAL FLOOR PLANS
A3-R0 CASEWORK ELEVATIONS

MECHANICAL

M1-R0 DEMOLITION LEVEL 1 PARTIAL FLOOR PLAN
M2-R0 NEW LEVEL 1 PARTIAL FLOOR PLAN

ELECTRICAL

E1-R0 EXISTING / DEMOLITION / NEW LEVEL 1 PARTIAL FLOOR PLAN

PROJECT NO. 1516-143310-P08

ISSUED FOR TENDER

NOVEMBER 6, 2015

Canada

GENERAL NOTES:

- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND CONDITIONS ON SITE BEFORE PROCEEDING WITH ANY PORTION OF THIS WORK. DO NOT SCALE FROM DRAWINGS. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
- CONTRACTOR IS ENCOURAGED TO VISIT THE SITE OF THE WORK PRIOR TO SUBMITTING A TENDER AND BECOME FAMILIAR WITH ALL SCOPE AND CONDITIONS OF THE WORK. DRAWINGS DO NOT NECESSARILY SHOW FULL EXTENT OF DEMOLITION.
- DISCREPANCIES BETWEEN DEMOLITION DRAWINGS AND NEW CONSTRUCTION DRAWINGS OR BETWEEN DRAWINGS AND SITE CONDITIONS TO BE REPORTED TO CONSULTANT PRIOR TO COMMENCING CONSTRUCTION. DRAWINGS DO NOT NECESSARILY SHOW FULL EXTENT OF DEMOLITION.
- FOR MECHANICAL AND ELECTRICAL DEMOLITION SEE MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.
- REFER TO ARCH., MECH., & ELEC. DRAWINGS AND SPECIFICATIONS FOR EXTENT OF WORK AND CO-ORDINATE WITH OTHER TRADES PRIOR TO THE COMMENCEMENT OF ANY WORK.
- PROVIDE ALL TEMPORARY FACILITIES AND ENCLOSURES AS SPECIFIED AND AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. PROTECT AND MAINTAIN OPERATIONAL ALL ENTRANCES, EXITS, FIRE & LIFE SAFETY SYSTEMS, CORRIDORS, ETC. AS REQUIRED THROUGHOUT THE PROGRESS OF THE WORK.
- BUILDING WILL BE OPERATIONAL DURING THE WORK. CONTRACTOR TO CO-ORDINATE WORK WITH OWNER, ETC. CARRY OUT CERTAIN WORK AFTER HOURS. SEE SPECIFICATION.
- ALL ITEMS THAT ARE REMOVED AND TO BE REINSTALLED SHOULD BE STORED IN A SAFE AREA OUTSIDE OF BUILDING AS NOT TO BE DAMAGED DURING THE COURSE OF WORK.
- ALL EQUIPMENT REMOVED TO BE TURNED OVER TO OWNER. ALL OTHER WASTE, DEBRIS AND ITEMS REMOVED, UNLESS INDICATED OTHERWISE, BECOMES PROPERTY OF CONTRACTOR FOR REMOVAL OFF-SITE IN AN AREA APPROVED BY THE MUNICIPALITY HAVING JURISDICTION.
- ALL WORK TO CONFORM TO LATEST EDITIONS OF THE FOLLOWING: NATIONAL BUILDING CODE OF CANADA, CANADIAN ELECTRICAL CODE, NATIONAL FIRE COMMISSIONER OF CANADA, ALL PROVINCIAL AND LOCAL CODES AND STANDARDS.
- CONTRACTOR TO PROVIDE ALL CUTTING, FITTING, PATCHING, FRAMING, FURRING, BLOCKING & MISCELLANEOUS RELATED COMPONENTS NECESSARY TO PROVIDE A COMPLETE AND OPERABLE INSTALLATION. CO-ORDINATE WITH SUB-TRADES.
- CONTRACTOR TO PROVIDE ALL CUTTING AND PATCHING OF EXISTING WALLS, CEILINGS AND FLOORS OUTSIDE OF LIMIT OF CONTRACT TO ACCOMMODATE MECH./ELEC. WORK. WHERE CUTTING AND PATCHING AFFECTS EXPOSED WALLS AND CEILINGS, PAINT WALLS AND CEILINGS TO NEAREST INTERSECTION.
- GENERAL CONTRACTOR TO MAKE GOOD ANY DAMAGE TO COMMON AREAS (i.e. CEILINGS, WALLS, FLOORS, etc.) DUE TO INSTALLATION OF NEW WORK. PAINT TO NEAREST CORNER TO MATCH EXISTING WHERE EXISTING SPACES ARE AFFECTED BY WORK OF THIS CONTRACT.
- FURRING SPACES AROUND PIPES, DUCTS, ONE SIDE OF PIPE SPACES, BRACING & COLUMNS SHALL BE CONSTRUCTED OF SAME MATERIAL AS WALL IN WHICH THEY OCCUR & EXTEND 100mm MIN. ABOVE CEILING U/N OTHERWISE. FURRING SPACES TO BE KEPT AS SMALL AS POSSIBLE.
- PATCH, REPAIR AND MAKE GOOD CONCRETE FLOORS LEFT DAMAGED BY DEMOLITION WORK. WHERE NEW FLOORING IS REQUIRED, REMOVE EXISTING FLOORING, BASE, ADHESIVE, SETTING BEDS ETC. AS REQUIRED TO ACCOMMODATE INSTALLATION OF NEW WORK. PREPARE EXISTING CONC. SLAB AS REQUIRED (GRIND, FILL ETC.) TO PROVIDE AN ACCEPTABLE SURFACE FOR INSTALLATION OF NEW FLOORING. COORDINATE EXTENT OF NEW FLOORING WITH EXISTING/NEW FLOOR PLAN.
- CONTRACTOR TO MOVE EXISTING FURNITURE, EQUIPMENT, ETC. TO ACCOMMODATE THE WORK. COORDINATE IN ADVANCE WITH OWNER. WHERE EXISTING EQUIPMENT IS TOO CUMBERSOME TO BE RELOCATED, CONTRACTOR IS TO PROTECT SUCH EQUIPMENT FROM DAMAGE DURING THE WORK. ANY EXISTING EQUIPMENT DAMAGED BY CONTRACTOR IS TO BE REPLACED AT CONTRACTORS EXPENSE.
- CONTRACTOR TO COVER EXISTING FURNITURE AND EQUIPMENT TO PROTECT FROM DUST ETC.
- MAINTAIN THE FOLLOWING CLEARANCES FROM EDGE OF DOOR TO WALL, ETC. ON LATCH SIDE OF ALL DOOR OPENINGS:
 - 300mm (MIN.) ON PUSH SIDE OF DOOR.
 - 600mm (MIN.) ON PULL SIDE OF DOOR.
- INSTALL BITUMINOUS COATING BETWEEN ALL DISSIMILAR METALS.
- ANY REQUIRED SHUT DOWN OF EXISTING MECH./ELEC. EQUIPMENT TO BE COORDINATED IN ADVANCE WITH OWNER.
- CONTRACTOR TO TEMPORARILY SUPPORT ALL MECH./ELEC. ITEMS MOUNTED ON/IN CEILING DURING REMOVAL OF EXISTING AND INSTALLATION OF NEW CEILING. COORDINATE EXTENT WITH MECH./ELEC. DRAWINGS.
- CONTRACTOR TO SUSPEND NEW CEILINGS, CONDUITS, ETC. FROM STRUCTURAL BEAMS AND JOISTS. DO NOT PENETRATE EXISTING DECK.
- MAIN CEILING TEES TO RUN IN SAME DIRECTION AS LIGHT FIXTURES.
- MECHANICAL & ELECTRICAL EQUIPMENT MOUNTED IN CEILING TILES TO BE CENTERED IN NEAREST TILE.
- CONTRACTOR TO COORDINATE CEILING GRID LAYOUT AND LOCATION OF FIXTURES & EQUIPMENT IN CEILING PRIOR TO COMMENCEMENT OF THE WORK.
- ARCHITECT SHALL FINALIZE ACTUAL CEILING GRID LAYOUT AND LOCATION OF FIXTURES & EQUIPMENT IN CEILING PRIOR TO COMMENCEMENT OF THE WORK.
- ALL FLOOR BASE TO BE 100mm HIGH U.N.O.
- REFER TO SPECIFICATION FOR HAZARDOUS MATERIALS ABATEMENT AND REPLACEMENT.

CABINETRY NOTES:

- ALL SHELVES TO BE ADJUSTABLE UNLESS NOTED OTHERWISE.
- UPPER CABINETS TO HAVE GLASS DOORS.
- ALL CABINETS TO BE PAINTED STEEL.
- ALL COUNTERTOPS TO BE ACID RESISTANT.
- ALL BASE CABINET COUNTERTOPS TO BE 762mm DEEP.
- ALL KNEE SPACES TO BE 914mm CLEAR WIDTH WITH KNEE SPACE PANEL AT REAR OF CABINET (INCLUDING ISLAND) UNLESS NOTED OTHERWISE.
- CABINET HEIGHTS AS SHOWN ON ELEVATIONS.
- CONTRACTOR TO CO-ORDINATE DIMENSIONS OF OPENINGS AND EQUIPMENT WITH CLIENT PRIOR TO CONSTRUCTION.

FINISH NOTES:

CEILING:
610x610mm ACOUSTIC TILE AND METAL GRID (CLEAN ROOM GRADE, WASHABLE). REFER TO SPECIFICATIONS. CEILING HEIGHT: 2740mm AFF.

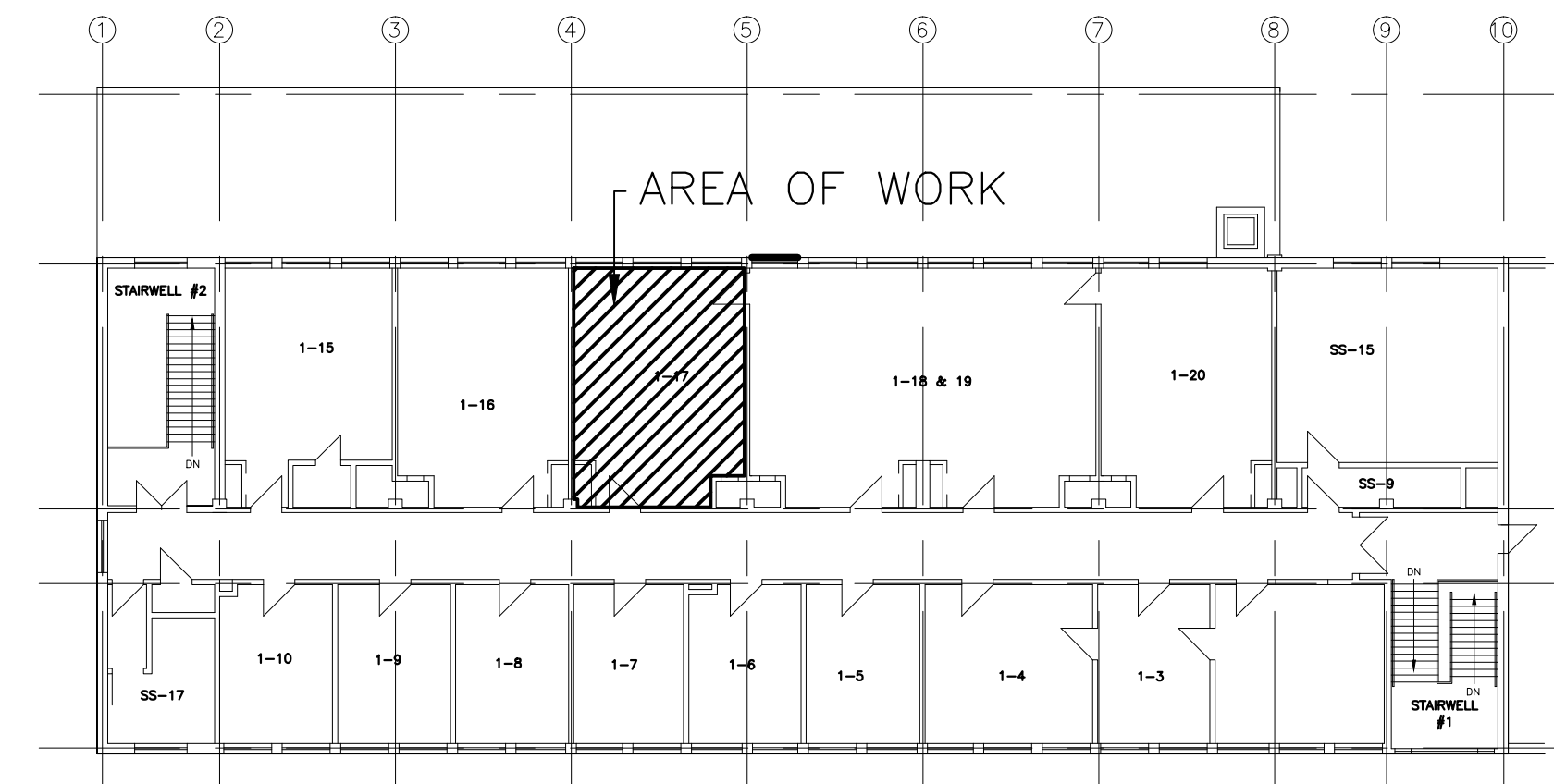
FLOORING:
ARMSTRONG MEDINTECH. HEAT WELD SEAMS. NO EXPOSED SEAMS IN OPEN FLOOR AREA. REFER TO SPECIFICATIONS. COLOR TO BE DETERMINED BY OWNER.

WALLS:
ALL EXISTING/NEW WALLS, FURRINGS AND BULKHEADS FULL EXTENT OF ROOM TO BE PLASTERED AND PAINTED UNLESS NOTED OTHERWISE. COLOR TO BE DETERMINED BY OWNER

WALL BASE:
NEW RUBBER WALL BASE FULL PERIMETER OF ROOM. COLOR TO BE DETERMINED BY OWNER

CABINETS:
AIR MASTER SYSTEMS - METAL LABORATORY CASEWORK. COLOR TO BE DETERMINED BY OWNER

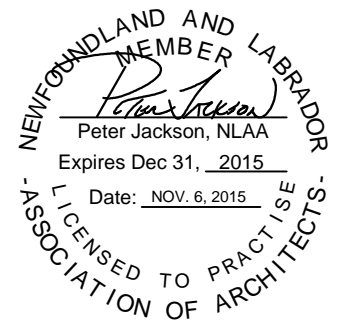
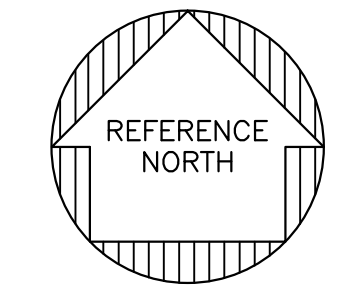
COUNTERTOPS:
EPOXY, BLACK, SEMI GLOSS FINISH.



KEY PLAN

ABBREVIATIONS

COJ	CHECK ON JOB
F	REFRIGERATOR (UNDERCOUNTER)
FIN.	FINISHED
FR	FREEZER (UNDERCOUNTER)
LSD	EXISTING LIQUID SOAP DISPENSER (RELOCATED)
NIC	NOT IN CONTRACT
PTD	PAPER TOWEL DISPENSER
SIM	SIMILAR
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
U/S	UNDERSIDE
T/O	TOP OF



0	ISSUED FOR TENDER	NOV. 6 2015
revisions		date

project

**ENTOMOLOGY LAB
RETROFIT
BUILDING #25
BROOKFIELD ROAD
ST. JOHN'S, NL**

**GENERAL NOTES
AND KEY PLAN**

designed P. JACKSON
date NOV. 6, 2015

drawn A. MELVIN
date JULY 21, 2015

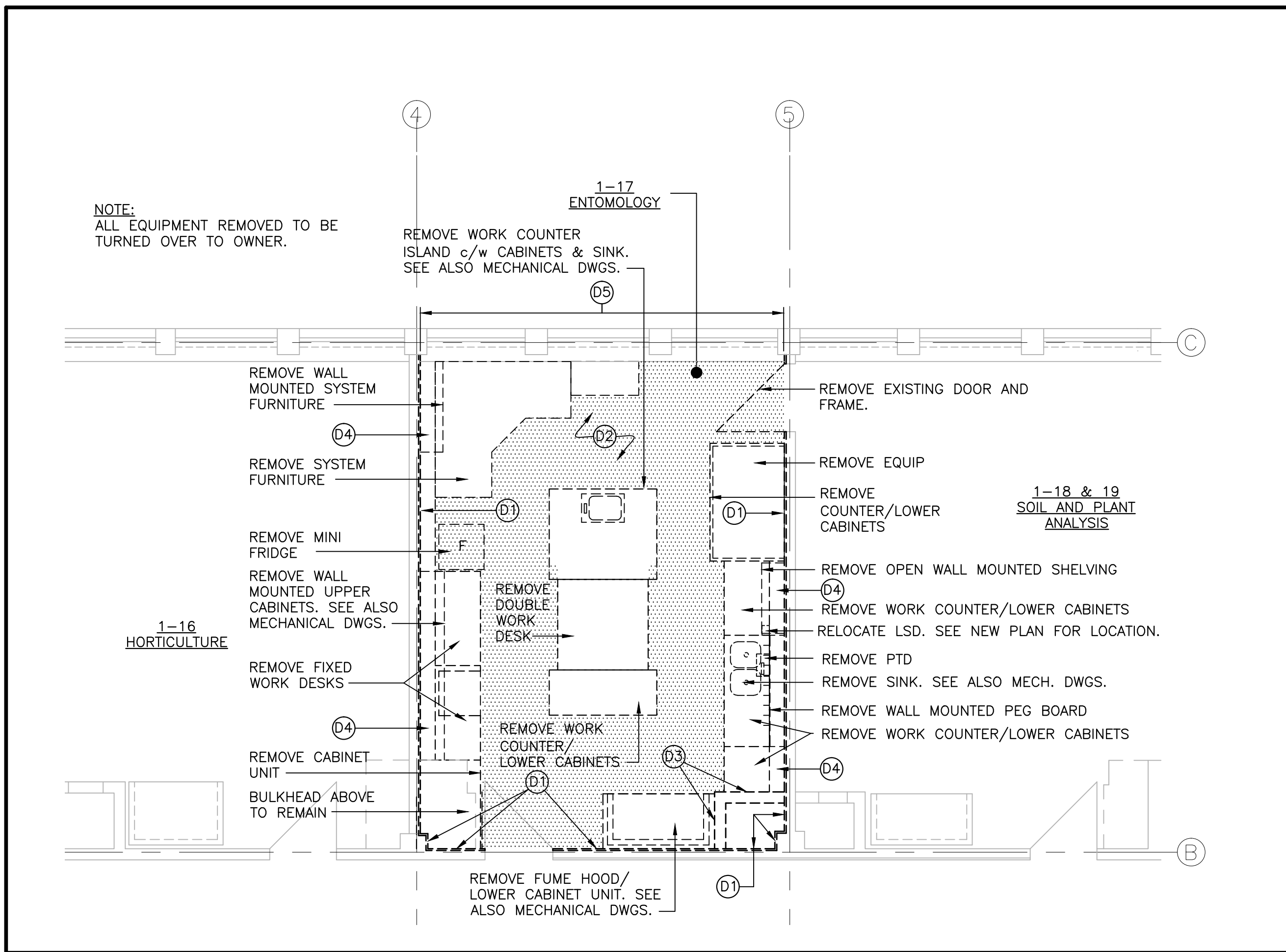
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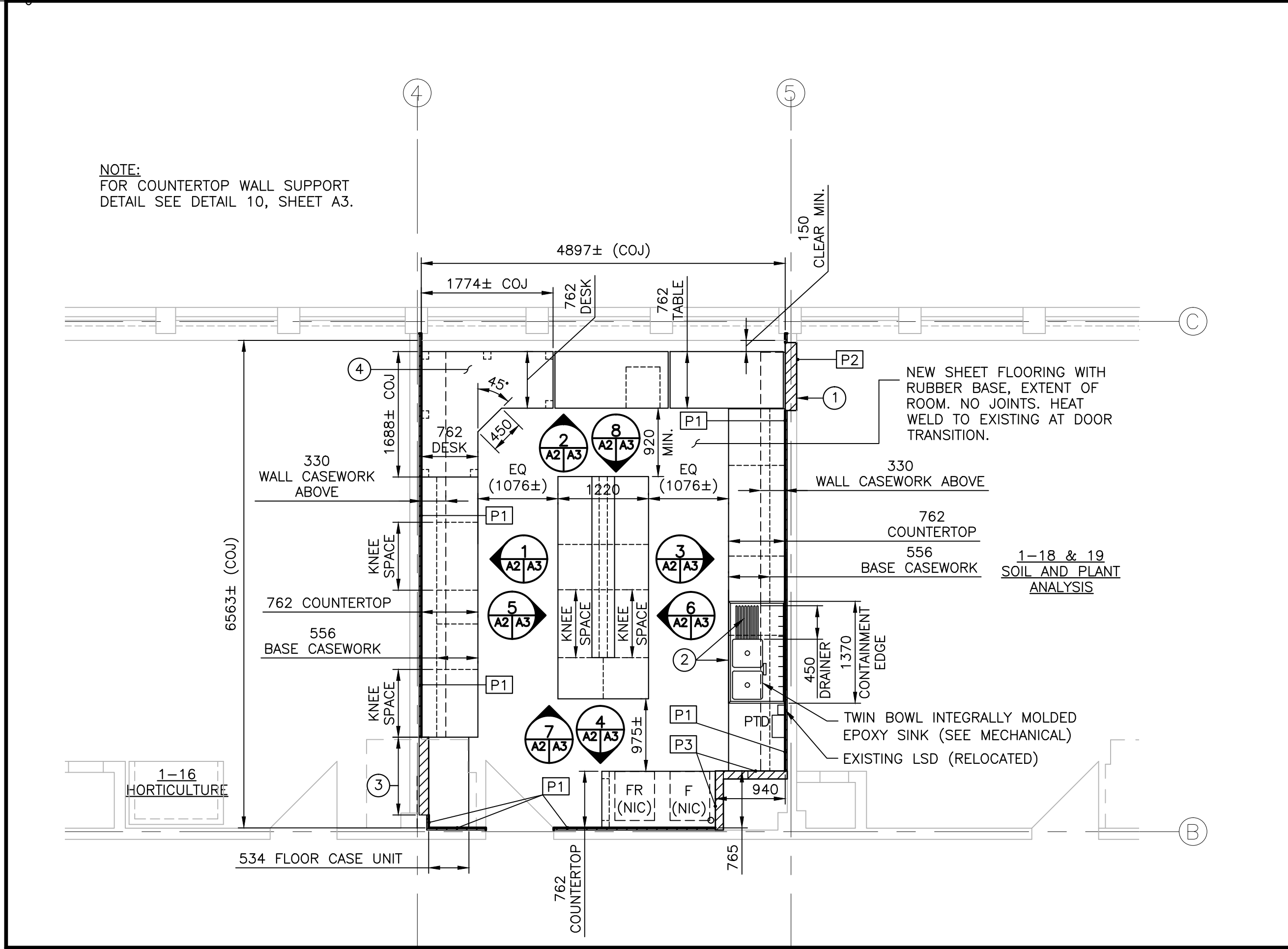
PWSC Project Manager / Administrateur de projets TPSGC

project number 1516-143310-P08

drawing no. A1-R0



EXISTING/DEMOLITION LEVEL 1 PARTIAL FLOOR PLAN 1
SCALE: 1:50



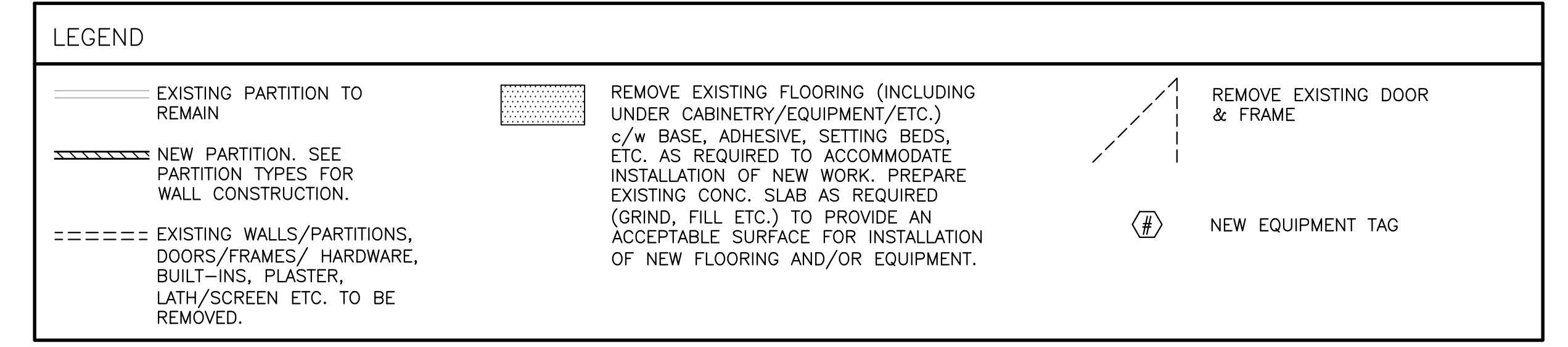
EXISTING/NEW LEVEL 1 PARTIAL FLOOR PLAN 2
SCALE: 1:50

DEMOLITION KEY NOTES:

- D1 REMOVE ALL HARD WALL PLASTER AND LATH/SCREEN, THIS SIDE OF WALL, FULL LENGTH, TO EXPOSE CLAY TILE MASONRY BACKUP. CLEAN, PATCH AND GRIND CLAY TILE BACKUP TO CREATE SUBSTRATE SUITABLE TO RECEIVE NEW DRYWALL/ DRYWALL FURRINGS.
- D2 REMOVE ENTIRE CEILING SYSTEM INCLUDING PLASTER, LATH/SCREEN AND SUPPORTING STRUCTURE.
- D3 REMOVE COMPLETE WALL STRUCTURE (HARD WALL PLASTER, LATH/SCREEN, CLAY TILE). SEE ALSO MECH./ELEC. DWGS.
- D4 REMOVE ENTIRE GYPSUM BOARD WALL CHASE BEHIND MILLWORK, FULL LENGTH OF WALL. SEE MECH./ELEC. DWGS FOR REMOVAL OF MECH./ELEC. ITEMS IN CHASE.
- D5 HAZARDOUS MATERIALS ABATEMENT REMOVAL TO ALSO INCLUDE REMOVAL OF INSULATION AROUND PIPING FULL LENGTH OF WALL IN AREA OF RADIATOR CABINETS. SEE ALSO MECHANICAL DRAWINGS. FOR FULL EXTENT OF HAZARDOUS MATERIALS ABATEMENT REMOVAL (INCLUDING MATERIALS & SYSTEMS) TO BE CARRIED OUT UNDER PROJECT SEE SPECIFICATION.

NEW CONSTRUCTION KEY NOTES:

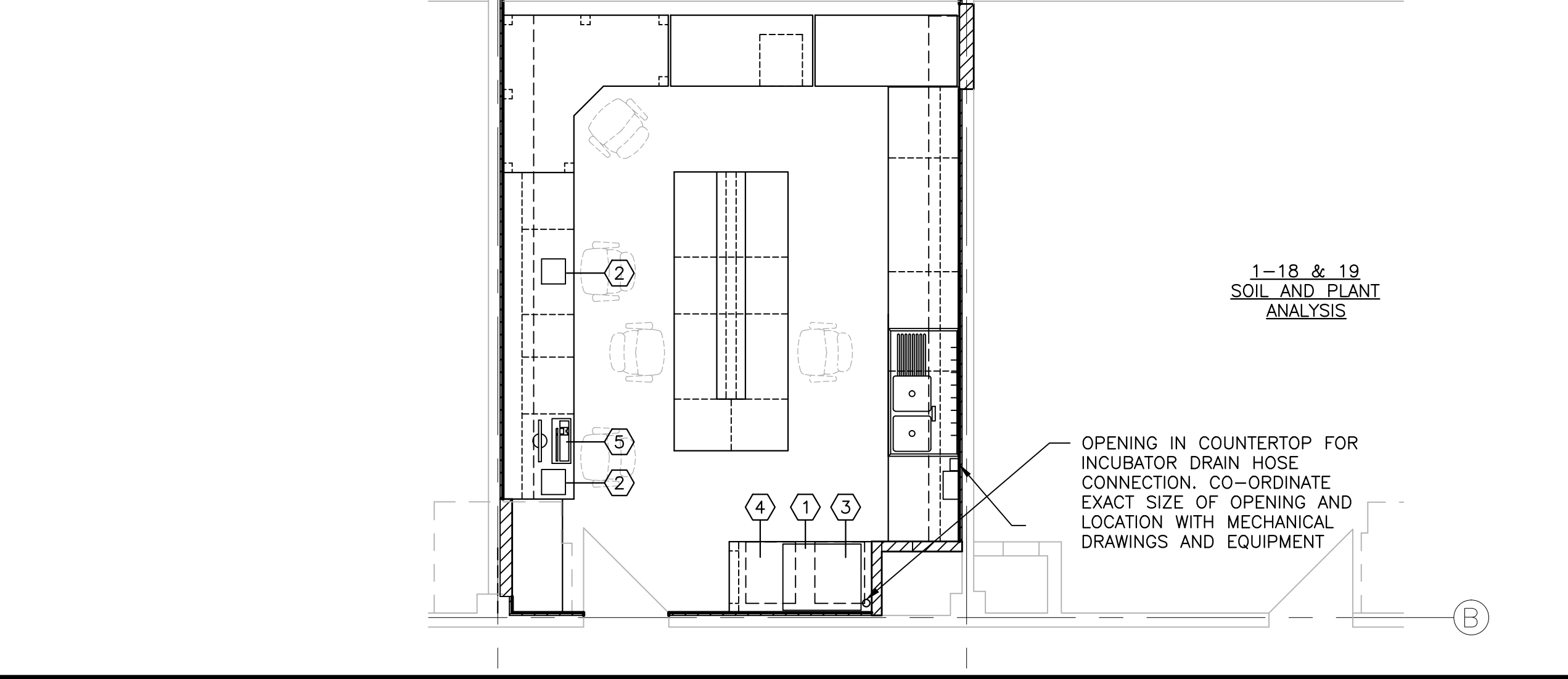
- 1 FILL-IN OPENING WHERE EXISTING DOOR REMOVED. SEE PARTITION TYPE FOR CONSTRUCTION & FINISH.
- 2 INTEGRALLY MOLDED CONTAINMENT EDGE PERIMETER OF SINK/DRAINER (4 SIDES). DRAINER SLOPED TO SINK.
- 3 NEW 16mm GYPSUM BOARD FURRING (BLOCKING TO SUIT). EXTEND EXIST. FURRING ALONG FULL BACK OF NEW FLOOR CASE UNIT. PAINT EXPOSED GYPSUM BOARD, SEE SHEET A1 FOR FINISHES.
- 4 NEW FREE-STANDING CORNER DESK. EPOXY COUNTERTOP TO MATCH CASEWORK COUNTERTOP. TABLE LEGS/PANELS/BRACING AS REQUIRED, SUPPLIED BY CASEWORK MANUFACTURER. NO PANELS SUPPORT PERMITTED ALONG NORTH SIDE (ADJACENT TO RADIATORS); AREA REQUIRED TO BE OPEN AREA TO ALLOW ADEQUATE HEAT CIRCULATION.



PARTITION TYPES LEGEND

Partition Type	FRR	Notes
P1	- 16mm TYPE X GYPSUM BOARD, PAINTED - 13mm METAL FURRING CHANNEL @ 400mm c/c MAX. - EXISTING WALL CONSTRUCTION	NOTES: EXTEND TO U/S METAL DECK
P2	- 16mm TYPE X GYPSUM BOARD, PAINTED (RM 1-17) - METAL STUD (SIZE TO SUIT EXISTING WALL THICKNESS) - 16mm TYPE X GYPSUM BOARD, UNPAINTED (RM 1-18)	NOTES: IN ROOM 1-18 TAPE/PLASTER WALL ONLY. NO PAINT.
P3	- 16mm TYPE X GYPSUM BOARD, PAINTED - 92mm METAL STUD	NOTES: EXTEND TO U/S METAL DECK

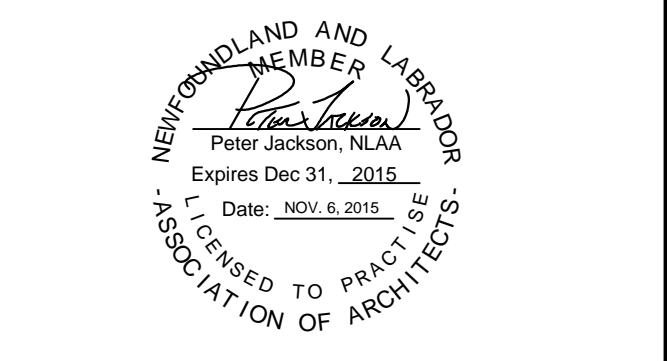
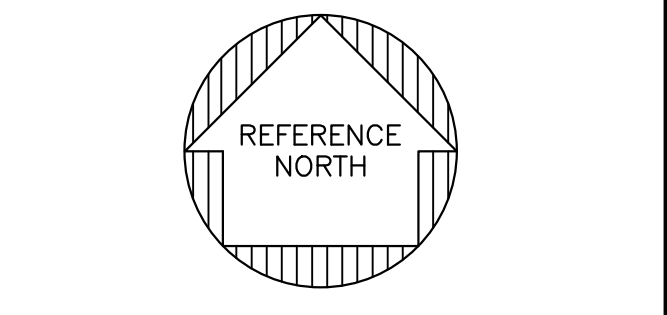
- EQUIPMENT LIST:**
- 1 INCUBATOR (NIC)
 - 2 MICROSCOPE (NIC)
 - 3 UNDERCOUNTER REFRIGERATOR (NIC)
 - 4 UNDERCOUNTER FREEZER (NIC)
 - 5 COMPUTER (NIC)



ENTOMOLOGY LAB EQUIPMENT LAYOUT 3
SCALE: 1:50

NOTES:

1. FOR GENERAL NOTES, CABINERY NOTES AND FINISH NOTES SEE SHEET A1.



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revisions		date

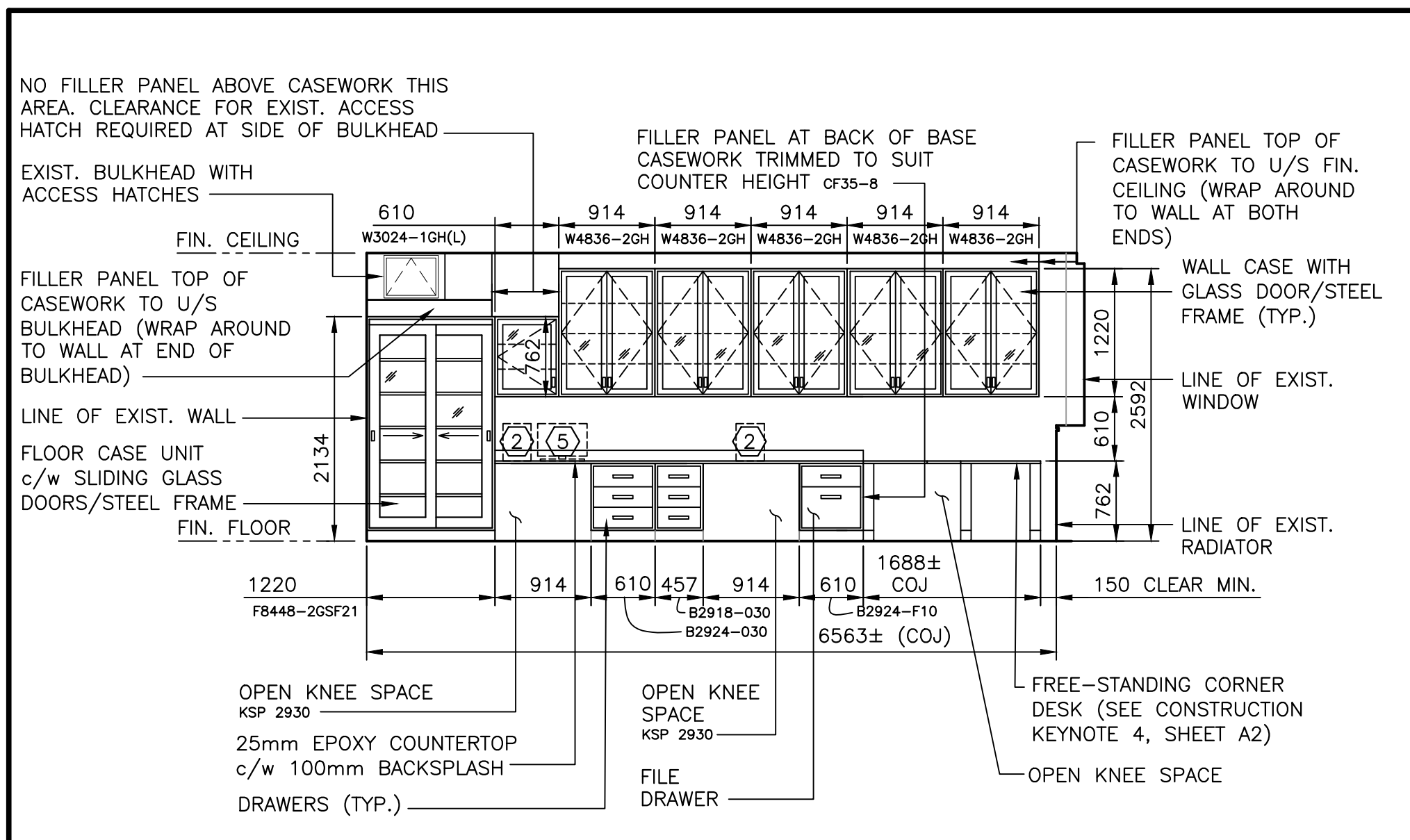
project: ENTOMOLOGY LAB RETROFIT BUILDING #25 BROOKFIELD ROAD ST. JOHN'S, NL

drawing: EXISTING/DEMOLITION/NEW LEVEL 1 PARTIAL FLOOR PLANS

designed: P. JACKSON
date: NOV. 6, 2015
drawn: A. MELVIN
date: JULY 21, 2015
approved:

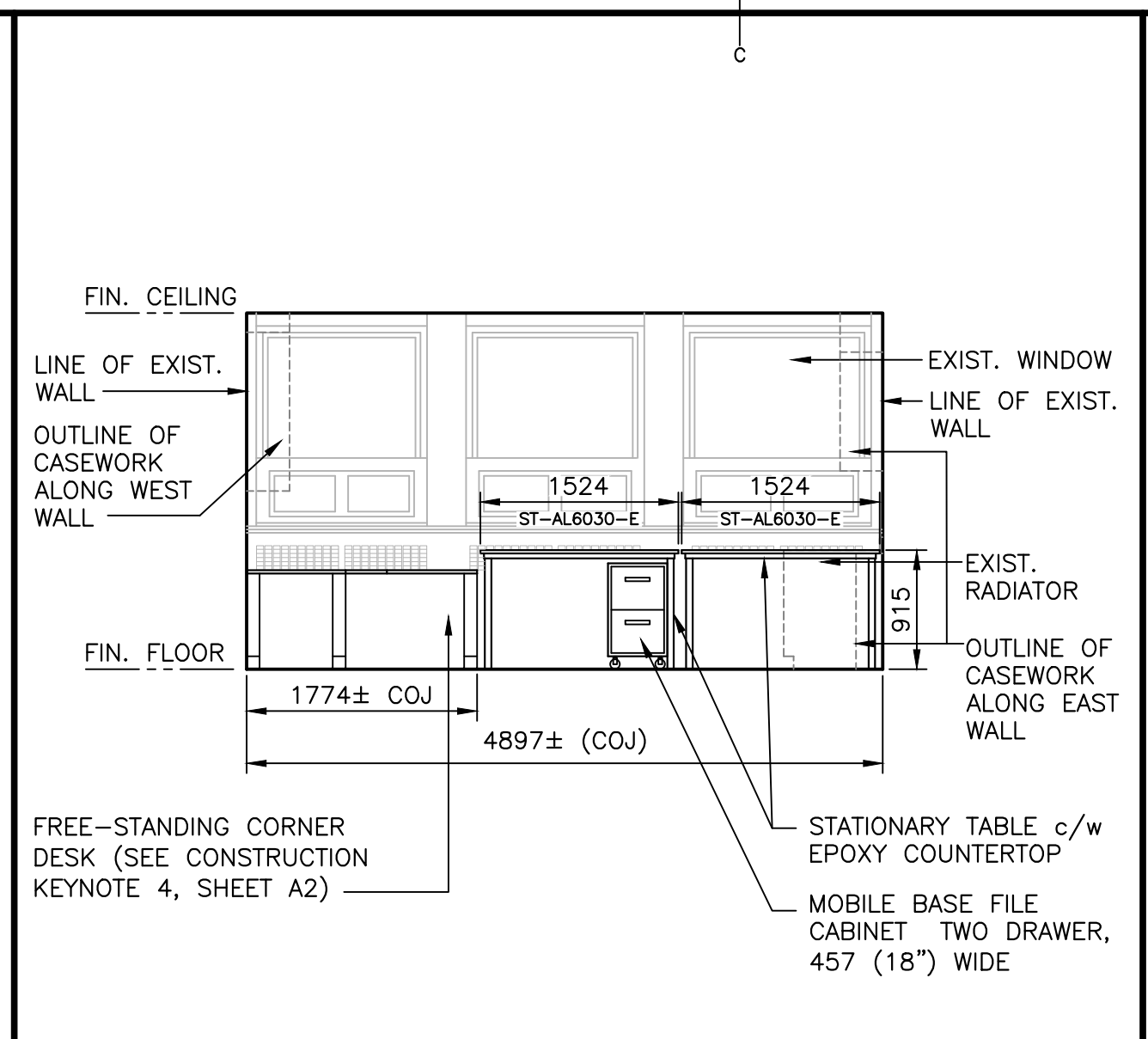
PWGC Project Manager / Administrateur de projets TPSGC
project number: 1516-143310-P08
no. du projet

drawing no.: A2-R0
no. du dessin



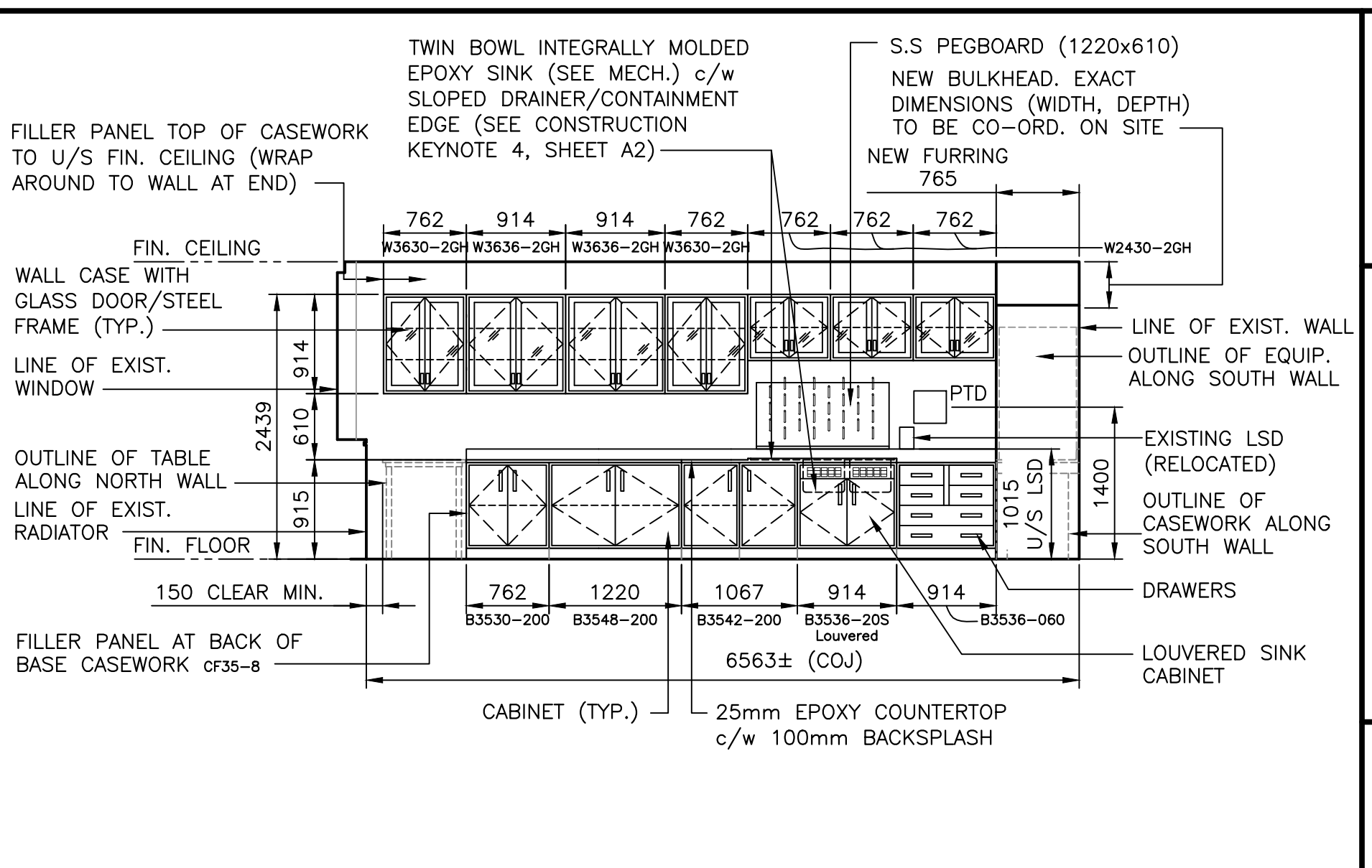
CASEWORK ELEVATION - WEST WALL

SCALE: 1:50



CASEWORK ELEVATION - NORTH WALL

SCALE: 1:50

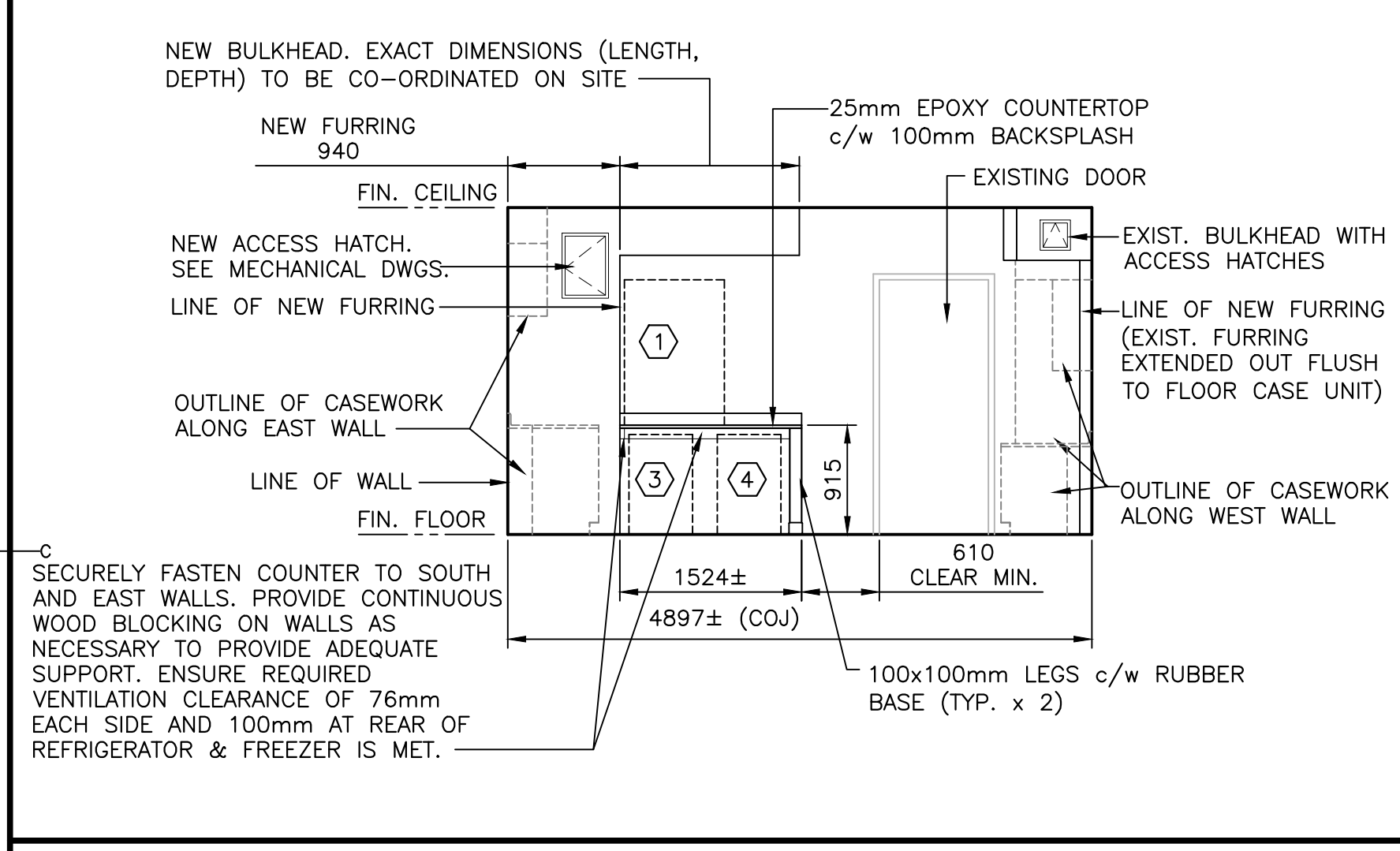
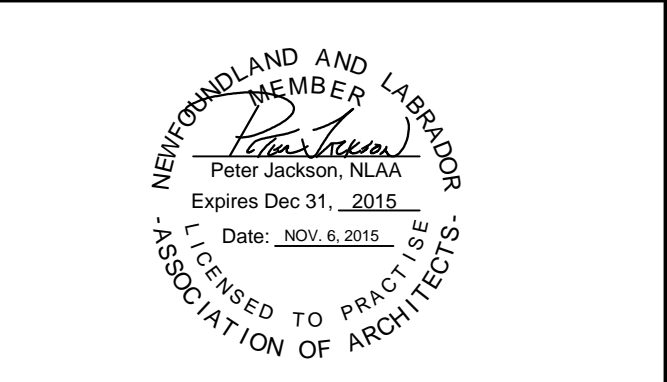


CASEWORK ELEVATION - EAST WALL

SCALE: 1:50

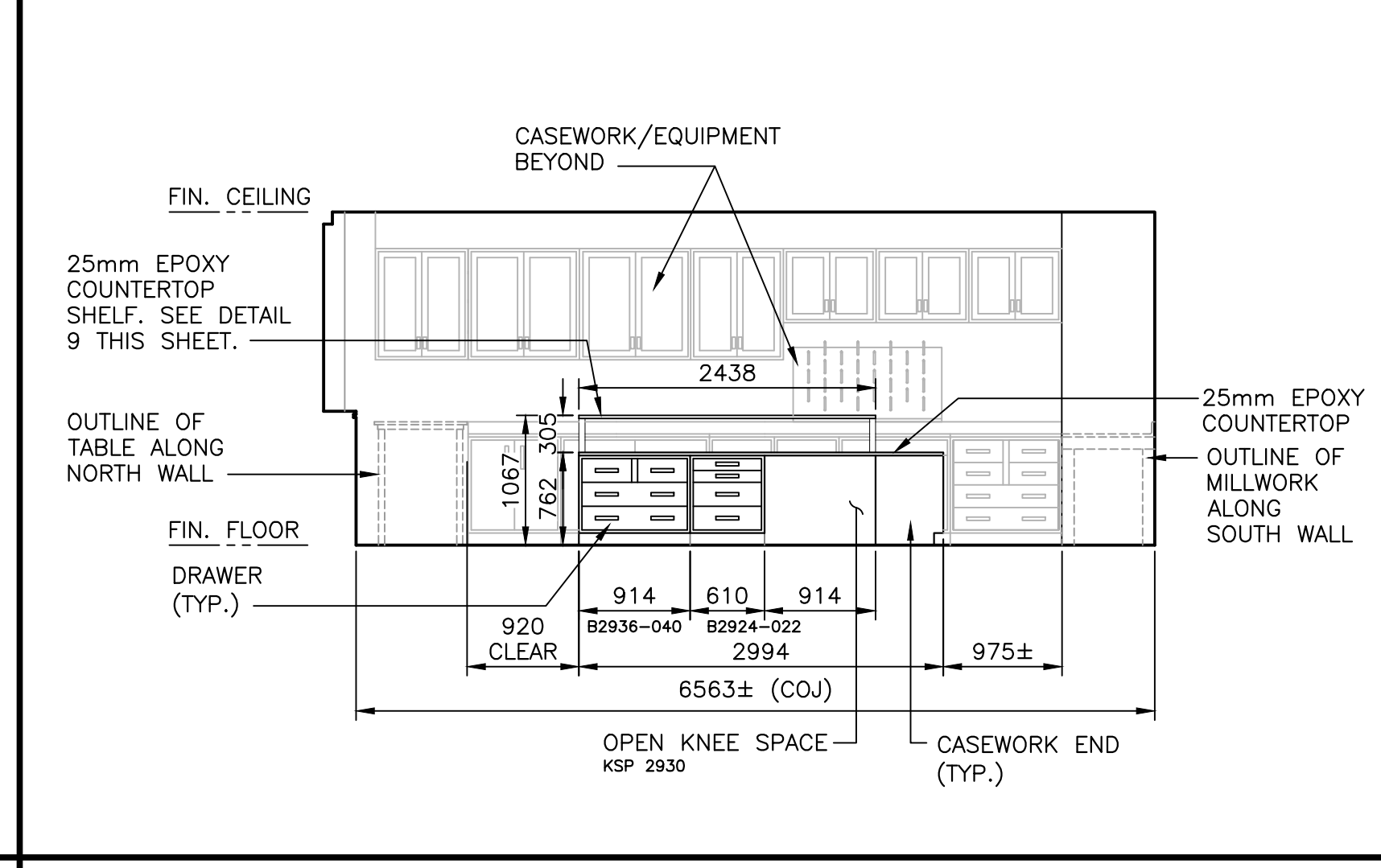


- NOTES:
- FOR EQUIPMENT LIST AND LEGEND SEE SHEET A2.
 - FOR GENERAL NOTES, CABINETRY NOTES AND FINISH NOTES SEE SHEET A1.
 - WHERE DISCREPANCY EXISTS BETWEEN CASEWORK PART NUMBER AND DIMENSIONS SHOWN ON DRAWINGS, DIMENSIONS TO GOVERN.



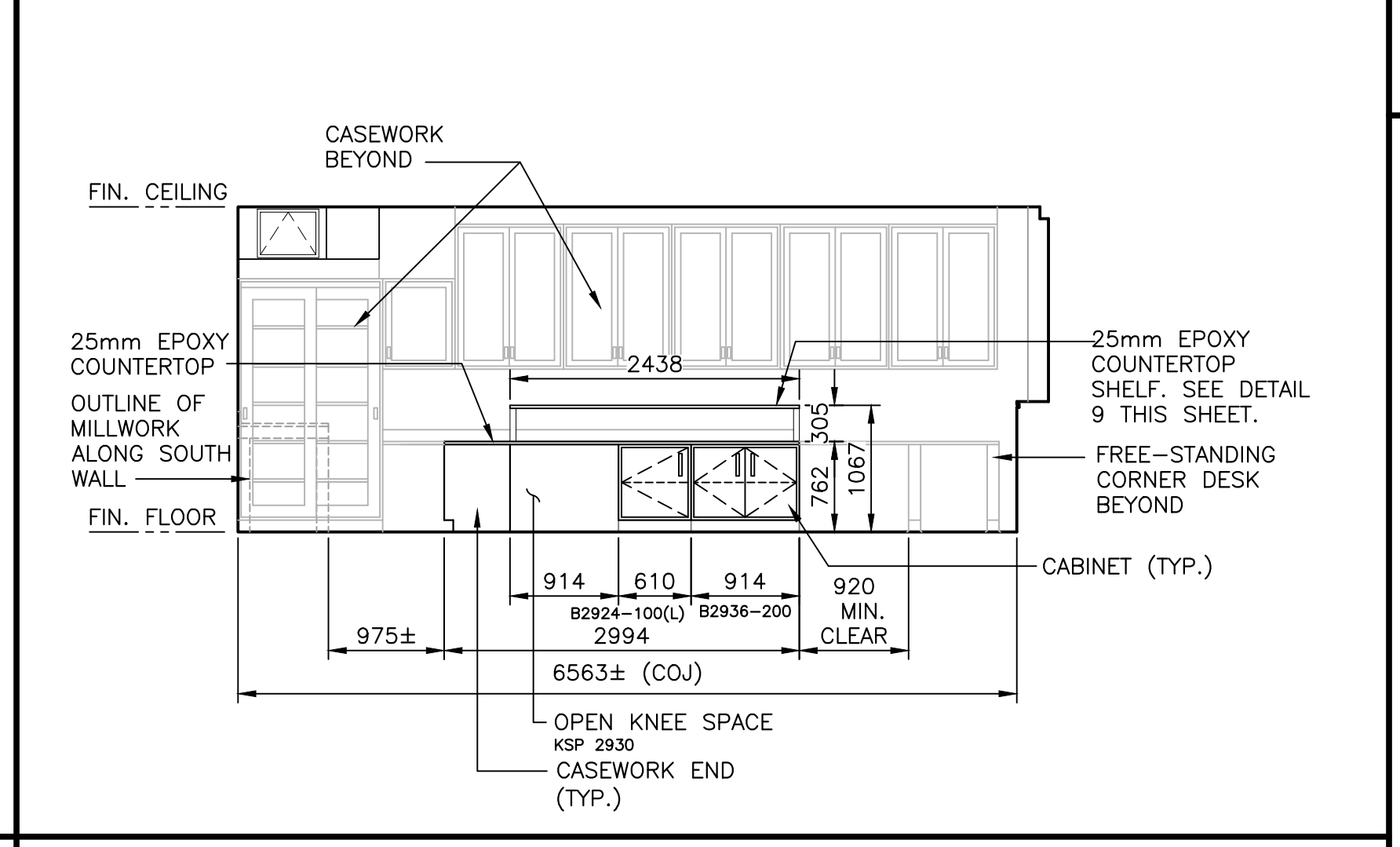
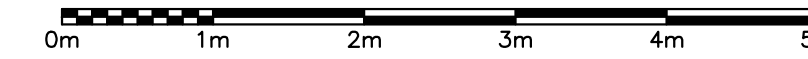
CASEWORK ELEVATION - SOUTH WALL

SCALE: 1:50



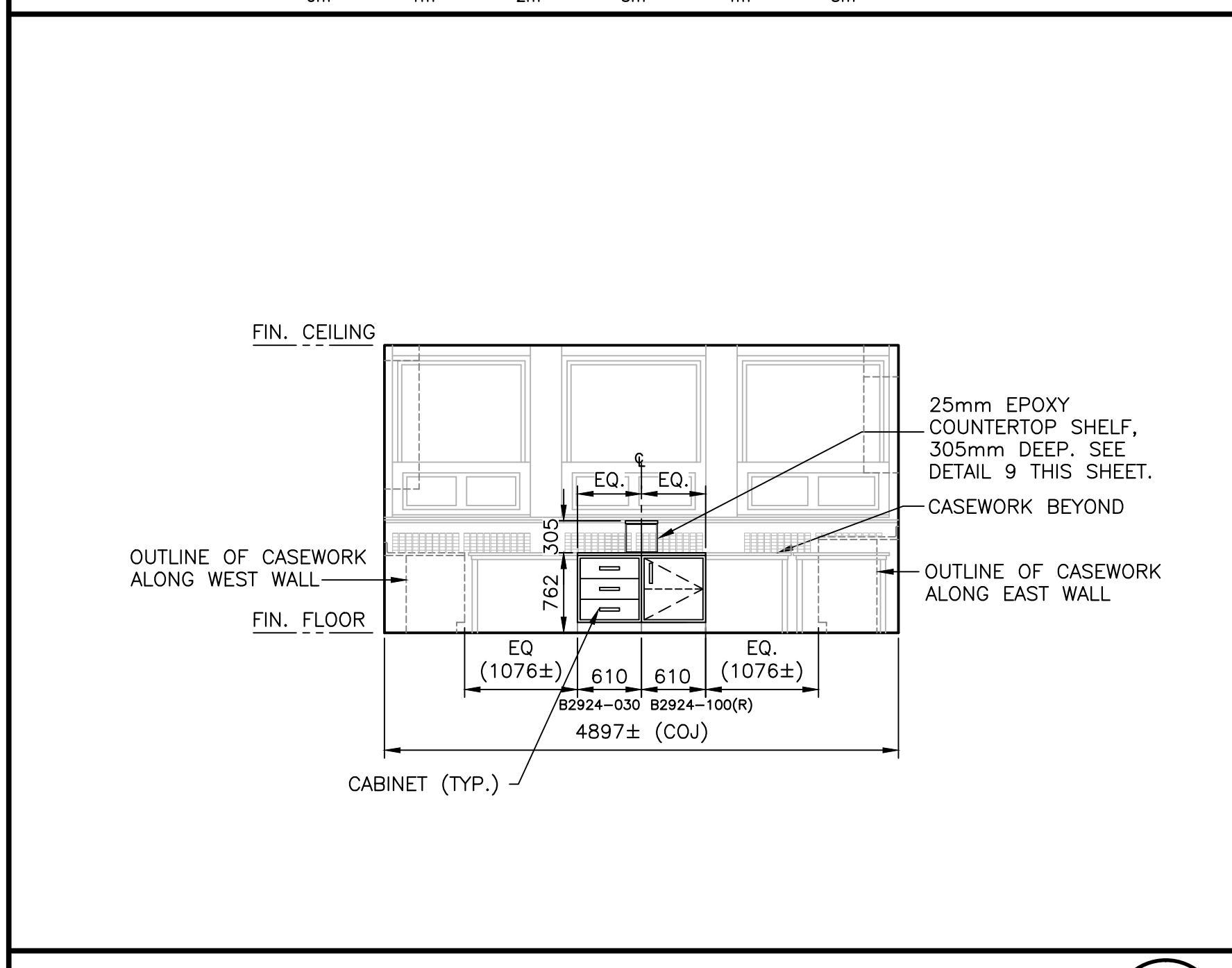
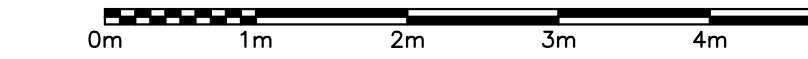
CASEWORK ELEVATION - ISLAND

SCALE: 1:50



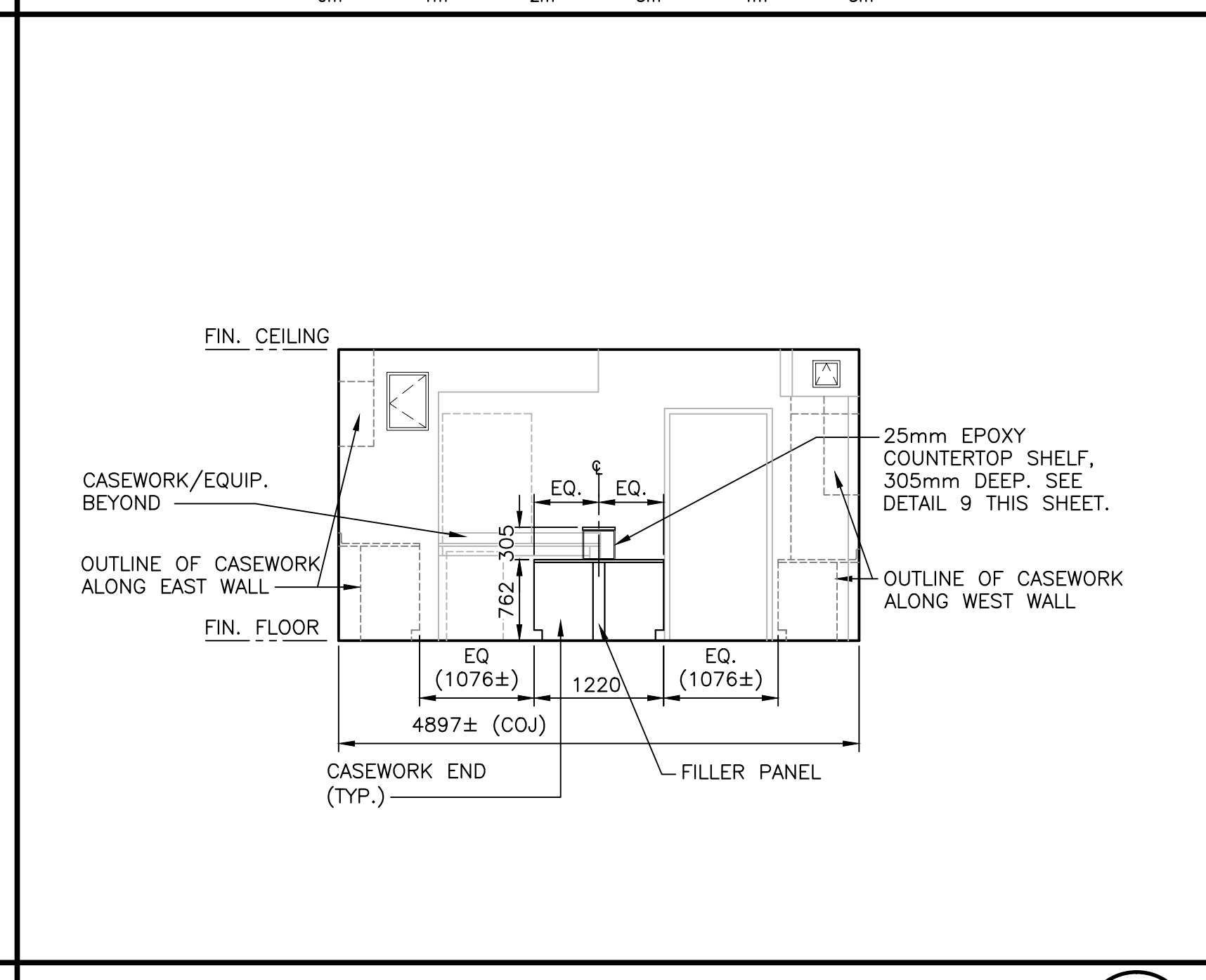
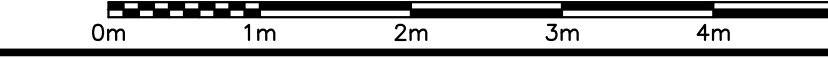
CASEWORK ELEVATION - ISLAND

SCALE: 1:50



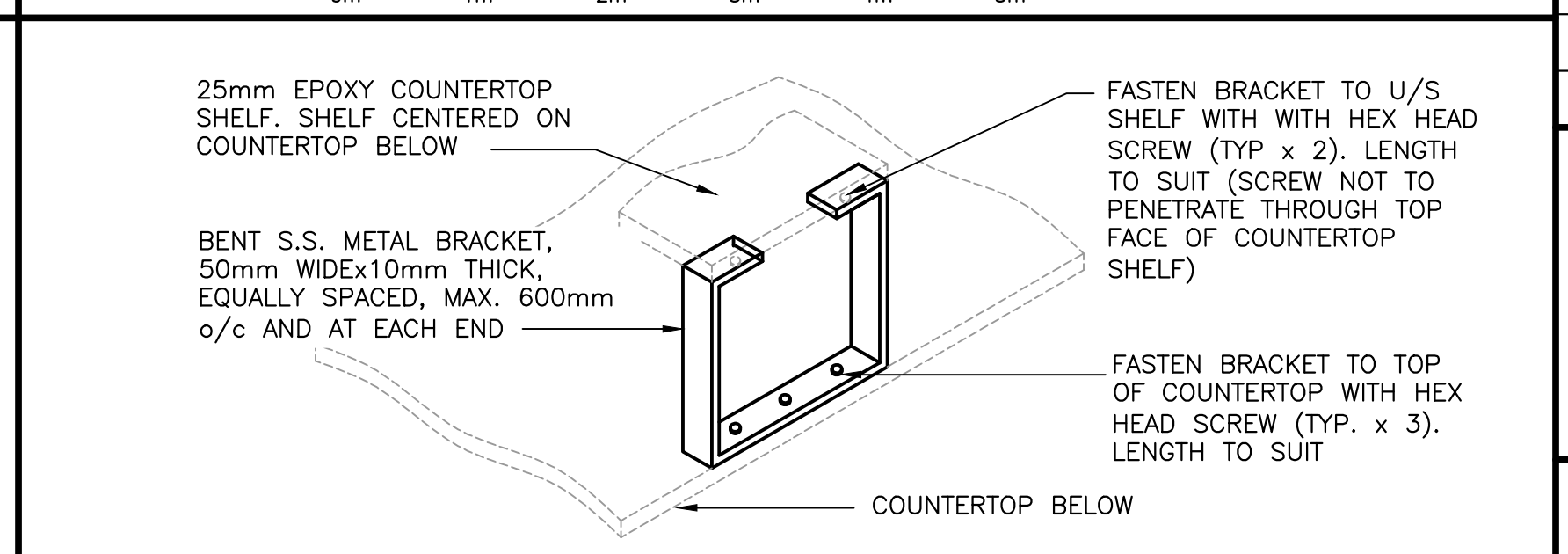
CASEWORK ELEVATION - ISLAND

SCALE: 1:50



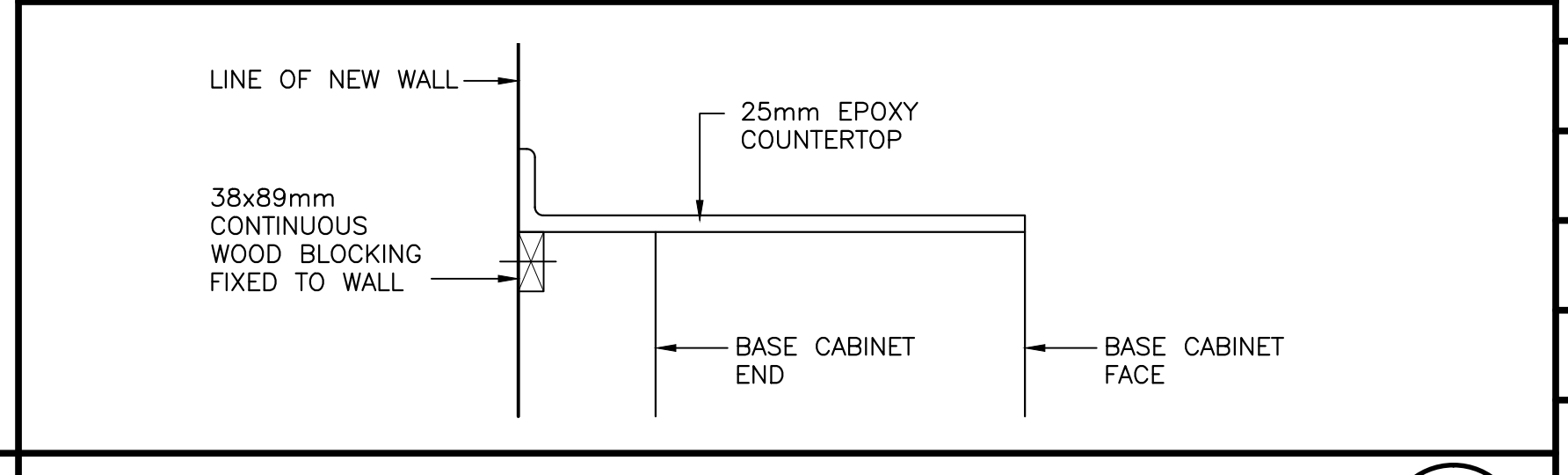
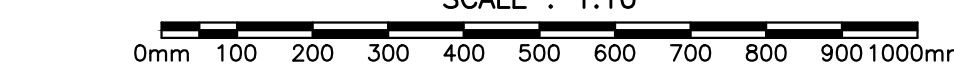
CASEWORK ELEVATION - ISLAND

SCALE: 1:50



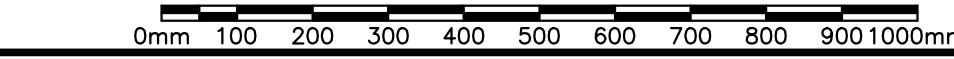
ISLAND SHELF BRACKET DETAIL

SCALE: 1:10



COUNTERTOP WALL SUPPORT DETAIL

SCALE: 1:10

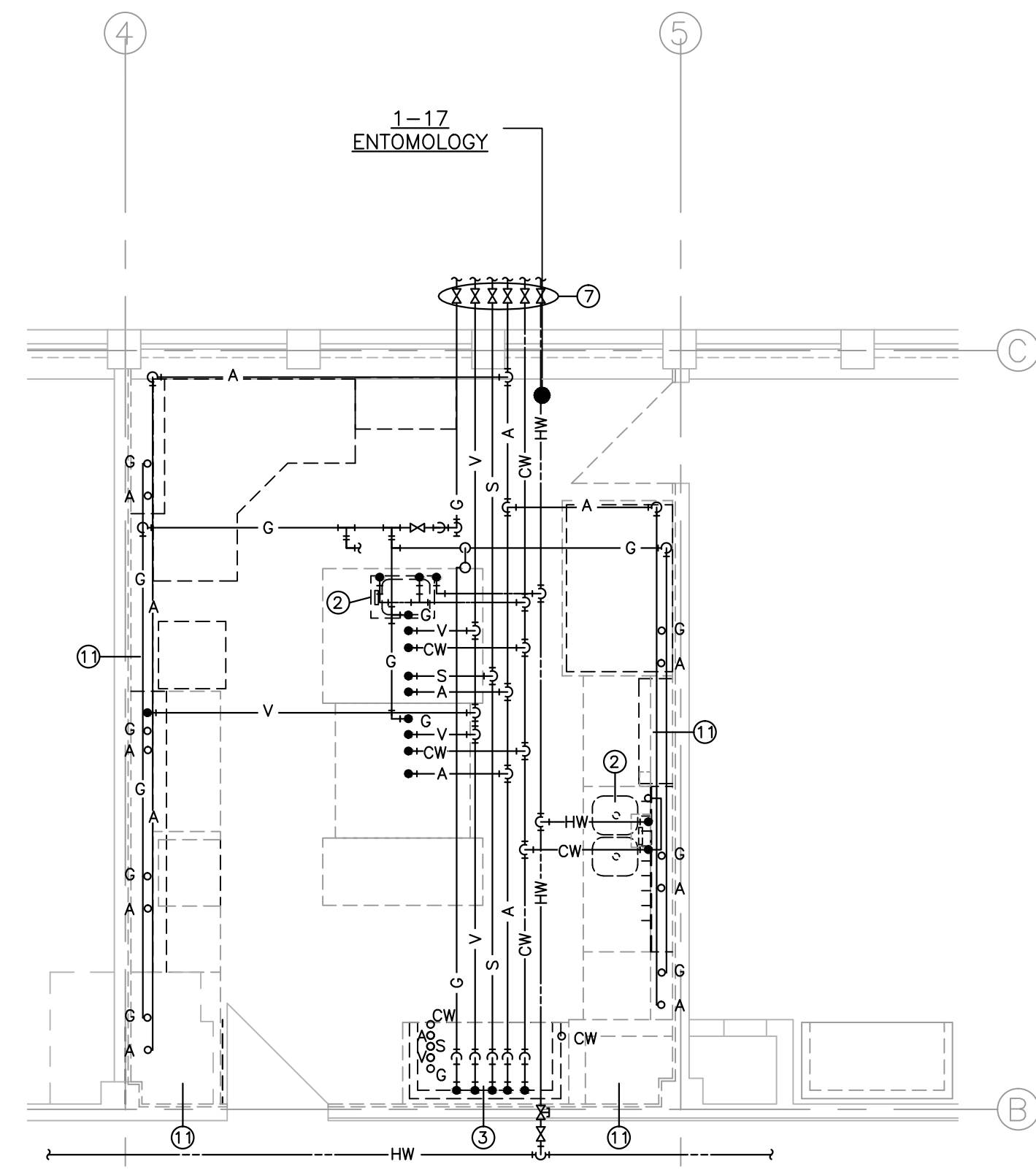


0	ISSUED FOR TENDER	NOV. 6 2015
revisions		date
project		project

ENTOMOLOGY LAB
RETROFIT
BUILDING #25
BROOKFIELD ROAD
ST. JOHN'S, NL

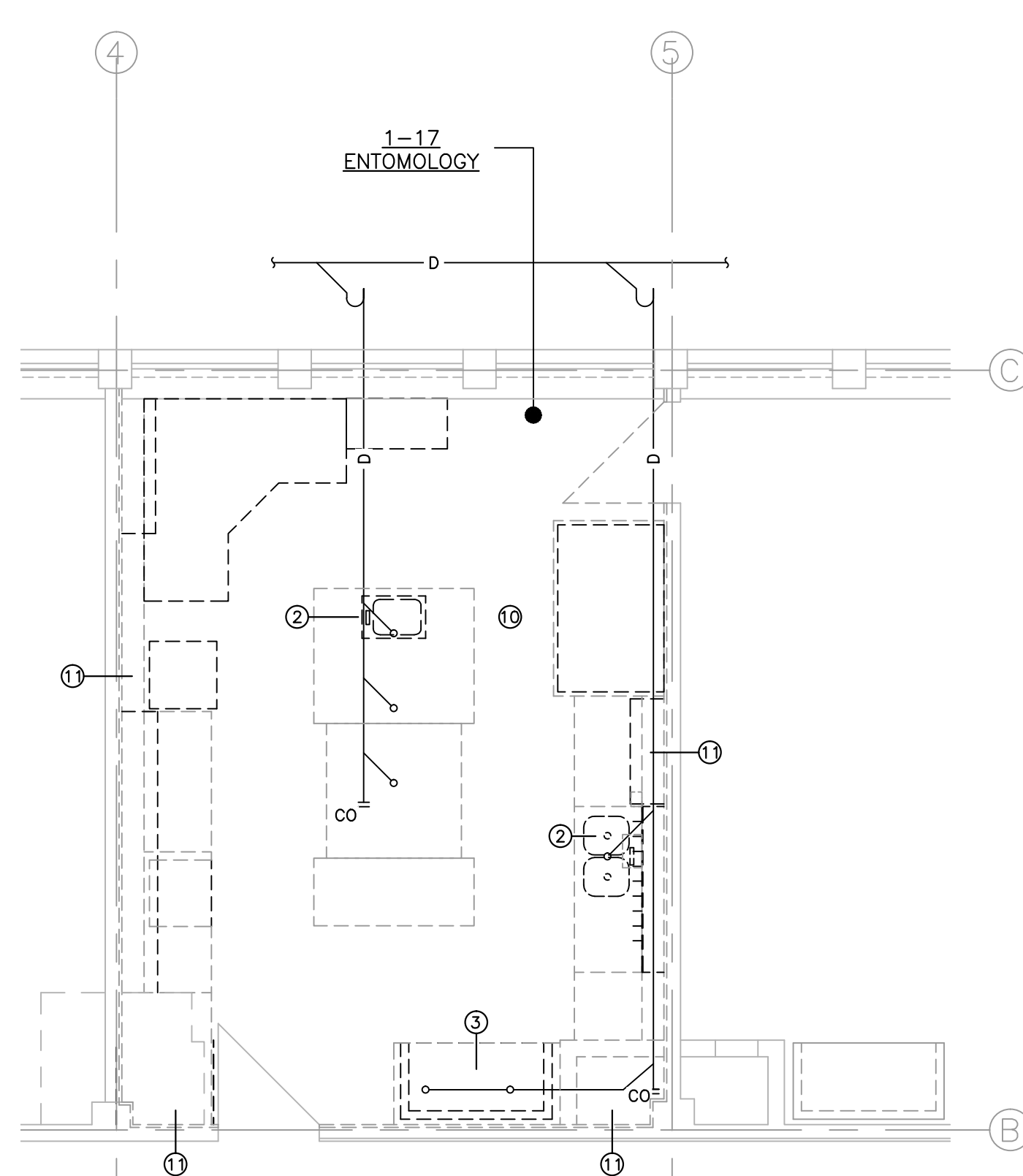
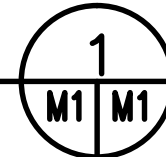
CASEWORK ELEVATIONS

designed	P. JACKSON	conçu
date	NOV. 6, 2015	
drawn	A. MELVIN	dessiné
date	JULY 21, 2015	
approved		approuvé
date		
Tender		Soumission
PWGC Project Manager	Administrateur de projets TPSGC	
project number	no. du projet	
1516-143310-P08		
drawing no.	no. du dessin	
A3-R0		



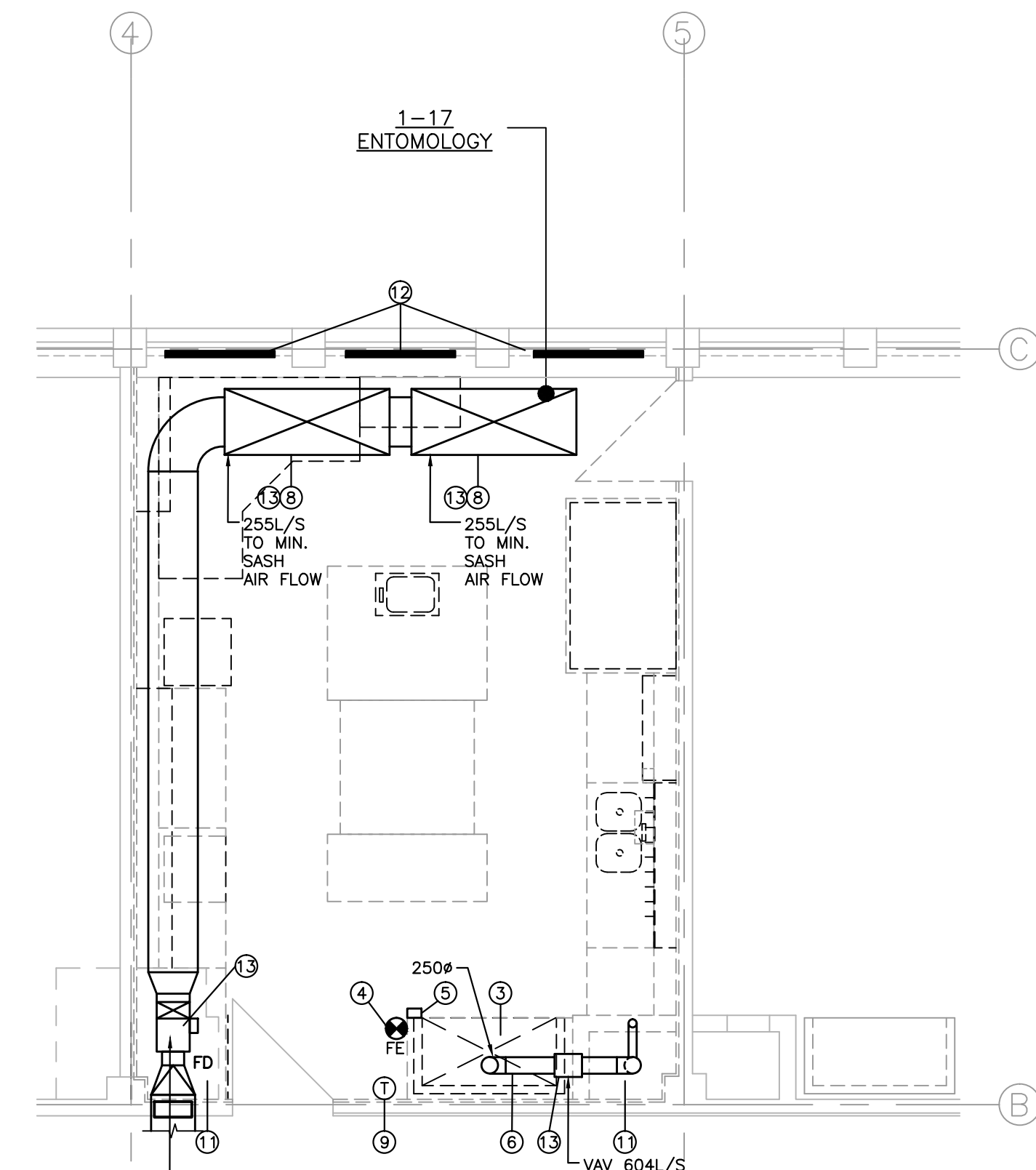
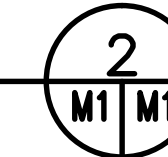
ENTOMOLOGY DW AND GAS SERVICES DEMOLITION PLAN

SCALE: 1:50
 0m 1m 2m 3m 4m 5m



ENTOMOLOGY DWV DEMOLITION PLAN

SCALE: 1:50
 0m 1m 2m 3m 4m 5m



ENTOMOLOGY HVAC DEMOLITION PLAN

SCALE: 1:50
 0m 1m 2m 3m 4m 5m



PIPING LEGEND

CW	DOMESTIC COLD WATER
HW	DOMESTIC HOT WATER
D	DRAINAGE LINE
G	GAS LINE
V	VACUUM LINE
S	STEAM LINE
A	AIR LINE
Valve symbol	VALVE
CO	CLEANOUT
Cap symbol	PIPE CAP

HVAC LEGEND

Existing VAV box symbol	EXISTING VAV BOX
Existing insulated ductwork symbol	EXISTING INSULATED DUCTWORK
FE symbol	EXISTING FIRE EXTINGUISHER
Radiator symbol	EXISTING RADIATOR
Supply air symbol	EXISTING SUPPLY AIR
Sash control symbol	EXISTING SASH VOLUME CONTROL
Thermostat symbol	EXISTING PNEUMATIC THERMOSTAT

0	ISSUED FOR TENDER	NOV. 6 2015
revisions		date
project		project

ENTOMOLOGY LAB RETROFIT BUILDING #25 BROOKFIELD ROAD ST. JOHN'S, NL

DEMOLITION LEVEL 1 PARTIAL FLOOR PLAN

designed	R. JONES	conçu
date	NOV. 6, 2015	
drawn	A. TURNQUEST	dessiné
date	JULY 27, 2015	
approved		approuvé
date		
Tender		Soumission

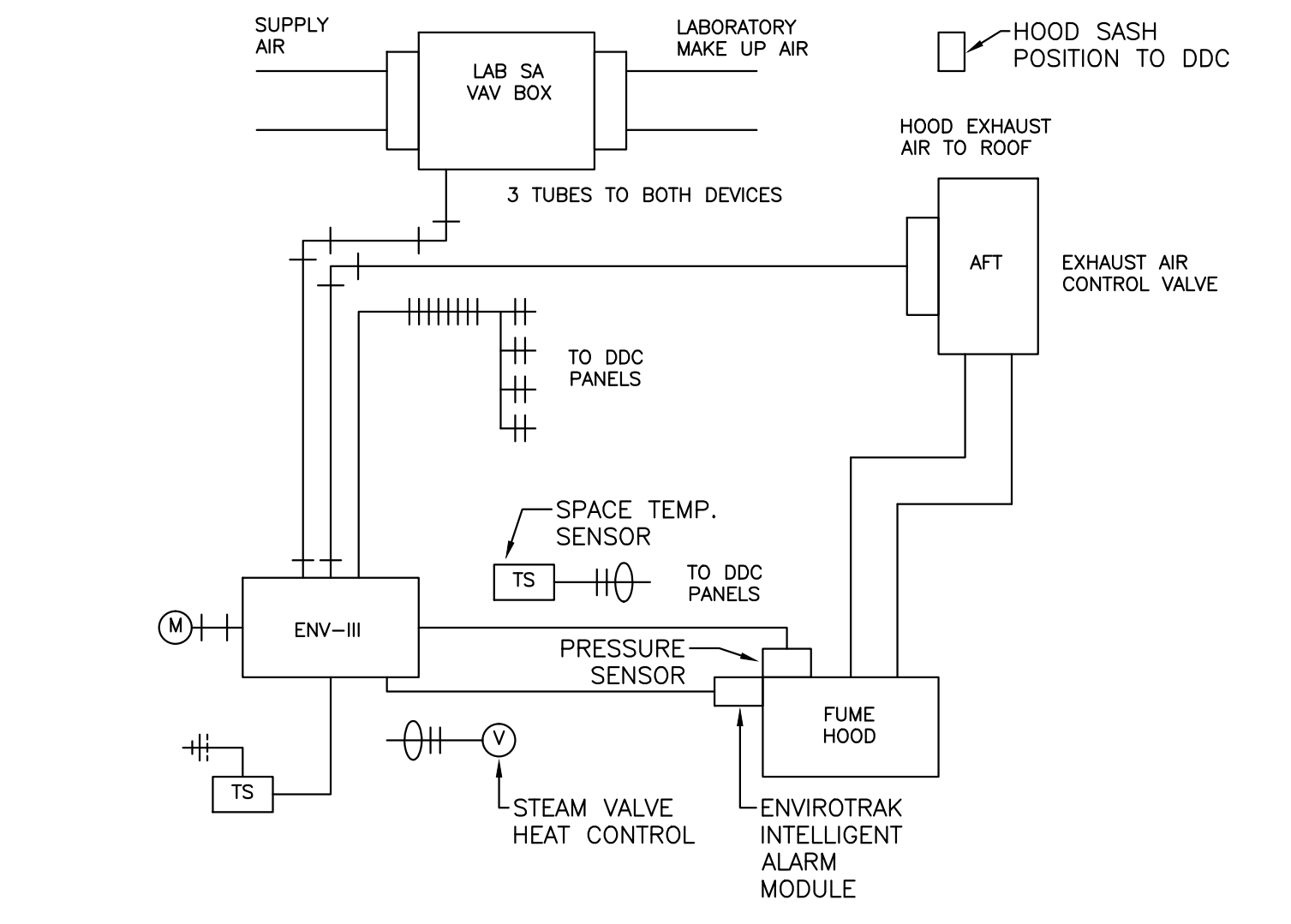
PWGC Project Manager	Administrateur de projets TPSC
project number	no. du projet
1516-143310-P08	
drawing no.	no. du dessin
M1-R0	

GENERAL NOTES:

- CONTRACTOR TO VERIFY ALL DIMENSIONS & EXISTING CONDITIONS ON SITE. ANY DISCREPANCIES OR UNSATISFACTORY CONDITIONS TO BE REPORTED TO THE DEPARTMENTAL REPRESENTATIVE BEFORE PROCEEDING WITH THE WORK.
- COORDINATE ALL MECHANICAL WORK ON SITE WITH THE DEPARTMENTAL REPRESENTATIVE.
- INFORMATION PERTAINING TO EXISTING EQUIPMENT SHOWN ON THESE DRAWINGS IS BASED ON AS-BUILT INFORMATION AND MAY NOT FULLY OR ACCURATELY REFLECT THE EXISTING CONDITIONS. REFER TO ARCHITECTURAL DRAWINGS FOR EXTENT OF ARCHITECTURAL WORK. CONTRACTOR TO VISIT SITE BEFORE TENDER CLOSES TO CONFIRM SCOPE OF WORK AND DETAILS OF EXISTING CONDITIONS. MAKE ARRANGEMENTS WITH DEPARTMENTAL REPRESENTATIVE IN RELATION TO SAME.
- ALL EXISTING PIPING SERVICES RUN CONCEALED IN ARCHITECTURAL ASSEMBLIES OR EXPOSED BELOW FLOOR.
- WHERE PIPING SERVICES ARE CALLED UP TO BE REMOVED COMPLETE, ALL REDUNDANT SERVICES TO BE CAPPED CONCEALED IN ARCHITECTURAL ASSEMBLIES OR BELOW FLOOR. CAP PIPING SERVICES OR DUCT SERVICES BACK WITHIN 150mm OF PIPE MAIN OR DUCT BRANCH RESPECTIVELY.
- COORDINATE REMOVAL OF ALL CONTROL WIRING AND LINE VOLTAGE WIRING WITH GENERAL CONTRACTOR, "CONTROLS UPGRADE CONTRACTOR" AND ELECTRICAL CONTRACTOR IN THE FIELD. WIRING 50V AND BELOW BY CONTROLS, WIRING ABOVE 50V BY ELECTRICAL.
- EXISTING ACID DRAIN PIPING IS GLASS TYPE. NEW PIPING TO BE RUN USING PIPING AS DESCRIBED IN "SECTION 22 13 19 - DRAINAGE WASTE AND VENT. PIPING-CORROSION PLASTIC RESISTANT". COORDINATE EXACT LOCATION AND REQUIREMENTS FOR CONNECTION OF NEW PIPING TO EXISTING, EXISTING PIPING TO BE REMOVED AND REINSTALLED AND EXISTING PIPING TO BE REMOVED IN THE FIELD WITH DEPARTMENTAL REPRESENTATIVE.
- EXISTING ACCESS HATCHES ASSOCIATED WITH THE REMOVAL OF EXISTING ARCHITECTURAL SURFACES/FURRINGS/CHASES TO BE REPLACED WITH NEW FIRE RATED ACCESS PANELS AFTER. REINSTATEMENT OF ARCHITECTURAL SURFACES/FURRINGS/CHASES. REROUTE ALL EXISTING MECHANICAL SERVICES TO REMAIN THAT WERE REMOVED TO FACILITATE THE RENOVATIONS AND INSTALL NEW MECHANICAL SERVICES IN CHASES PROVIDED WITH LAB CASEWORK. COORDINATE ALL WORK WITH THE LAB CASEWORK SHOP DRAWINGS, THE GENERAL CONTRACTOR, OTHER TRADES AND THE DEPARTMENTAL REPRESENTATIVE IN THE FIELD.
- CONTROL SCHEMATIC & SEQUENCE TAKEN FROM CONTROLS AS-BUILTS. CONFIRM EXACT DETAILS ON SITE. UNDER THIS CONTRACT, ALL CONTROL WORK WILL BE DONE BY "CONTROLS UPGRADE CONTRACTOR". COORDINATE ALL CONTROL WORK WITH THIS CONTRACTOR. SCHEMATIC DETAILS SHOWN FOR REFERENCE ONLY. FOR FINAL DETAILS, REFER TO "CONTROLS UPGRADE CONTRACTOR" APPROVED SHOP DRAWINGS.
- TAB (TESTING, ADJUSTING AND BALANCING)
 - TAB CONTRACTOR SHALL: BALANCE AIR SYSTEMS AS SHOWN ON THE DRAWINGS; PERFORMANCE TOLERANCE SHALL BE 5% OF DESIGN VALUES; CONTRACTOR SHALL BE NEBB CERTIFIED AND TAB REPORT DONE TO NEBB STANDARDS; SUBMIT ONE COPY OF REPORT.
 - SUBMIT TAB REPORT TO OWNERS REPRESENTATIVE FOR APPROVAL SHOWING:
 - MAXIMUM & MINIMUM AIR FLOW BEFORE WORK STARTS.
 - MAXIMUM & MINIMUM AIR FLOW AFTER COMPLETION OF PROJECT.
- INSULATE ALL NEW HOT AND COLD WATER WITH 25mm FIBERGLASS PIPE INSULATION WITH ALL SERVICE JACKED. TAPE AND SEAL ALL JOINTS. ALL MATERIALS SHALL HAVE A MAXIMUM FLAME SPREAD RATING LESS THAN 25 AND A MAXIMUM SMOKE DEVELOPMENT OF LESS THAN 50 IN ACCORDANCE WITH CAN/ULC S102.

DEMOLITION NOTES:

- NOT APPLICABLE.
- REMOVE EXISTING STAINLESS STEEL SINK, SINK FITTINGS, ALL ASSOCIATED PIPING SERVICES AND AUXILIARIES COMPLETE.
- REMOVE EXISTING FUME HOOD, CONTROLS, WIRING ALL ASSOCIATED PIPING SERVICES AND AUXILIARIES COMPLETE. COORDINATE CONTROLS WITH "CONTROLS UPGRADE CONTRACTOR".
- EXISTING FIRE EXTINGUISHER TO BE REMOVED. SAVE FOR REUSE IN NEW LAYOUT.
- EXISTING LAB SASH AIR VOLUME CONTROL TO BE REMOVED COMPLETE. SEE TYPICAL FUME HOOD CONTROL DETAIL AND SEQUENCE OF OPERATION THIS DRAWING.
- EXISTING SS FUME EXHAUST DUCT TO BE REMOVED TO THIS APPROXIMATE LOCATION. SAVE FOR REUSE IN NEW LAYOUT. EXISTING EXHAUST VAV BOX TO REMAIN.
- EXISTING PIPING SERVICES ISOLATION VALVES.
- EXISTING LAMINAR FLOW SUPPLY AIR DIFFUSERS TO BE REMOVED TO FACILITATE THE INSTALLATION OF NEW SURFACES. EXTEND DUCTWORK AS REQUIRED.
- EXISTING PNEUMATIC THERMOSTAT AND CONTROLS TO BE REMOVED COMPLETE.
- UNDER THIS CONTRACT, COMPLETE ASBESTOS ABATEMENT OF THE LABS WILL OCCUR. THIS WORK INCLUDES BUT IS NOT LIMITED TO REMOVAL OF: EXISTING ASBESTOS CONTAINING GYPROC WALLS, CEILINGS, TILES, FURRINGS, GYPROC BEHIND FURRINGS & PIPE INSULATION COVERINGS ASSOCIATED WITH THE RENOVATED AREA. EXTENT OF WORK TO BE FIELD DETERMINED. COORDINATE THE REMOVAL OF EXISTING MECHANICAL TO REMAIN IN FURRINGS, ABOVE CEILINGS & IN CHASES WITH GENERAL CONTRACTOR, OTHER TRADES & THE DEPARTMENTAL REPRESENTATIVE. REMOVED SURFACES INDICATED WITH DASHED LINES. FOR EXTENT OF DEMOLITION, REFER TO ARCHITECTURAL DRAWINGS.
- EXISTING ARCHITECTURAL ASSEMBLY HOUSING ELECTRICAL RECEPTACLES, ELECTRICAL, MECHANICAL, PIPING SERVICES, ETC. TO BE REMOVED COMPLETE.
- EXISTING ARCHITECTURAL ASSEMBLY HOUSING RADIATORS, STEAM PIPING, VALVES, CONTROLS, ETC. TO REMAIN. COORDINATE WITH GENERAL CONTRACTOR, LOCATION OF ARCHITECTURAL FURNISHINGS, SO AS NOT TO BLOCK HEAT FLOW FROM EXISTING RADIATORS. REMOVE EXISTING RADIATOR FRONT PANELS TO FACILITATE THE REMOVAL OF ASBESTOS INSULATION BY ABATEMENT CONTRACTOR.
- TAB CONTRACTOR TO MEASURE: MAXIMUM AND MINIMUM SUPPLY AIR FLOWS IN THE SUPPLY AIR DUCT AND AT THE DIFFUSERS; CORRESPONDING MAXIMUM AND MINIMUM AIR FLOWS AT THE HOOD WITH THE HOOD AT MAXIMUM AND MINIMUM. COORDINATE THIS WORK WITH THE "CONTROLS UPGRADE CONTRACTOR". INCLUDE THIS DATA IN THE TAB REPORT FOR THE PROJECT.
- NOT APPLICABLE.



LABORATORY PRESSURIZATION CONTROL SEQUENCE

THE DDC LABORATORY TRACKING SYSTEM MEASURES TOTAL SUPPLY AND TOTAL EXHAUST FLOW INTO AND OUT OF THE LABORATORY SPACE. SUPPLY IS VARIED TO MAINTAIN A FIXED AIR VOLUME DIFFERENTIAL (OFFSET) BETWEEN THE SUPPLY AND TOTAL EXHAUST IN A CLOSED LOOP TRACKING MANNER.

THE SUPPLY AND EXHAUST AIR VOLUMES IN THE SPACE SHALL BE CONTROLLED (VARIED) IN SUCH A MANNER AS TO SATISFY VOLUME (MASS) CRITERIA.

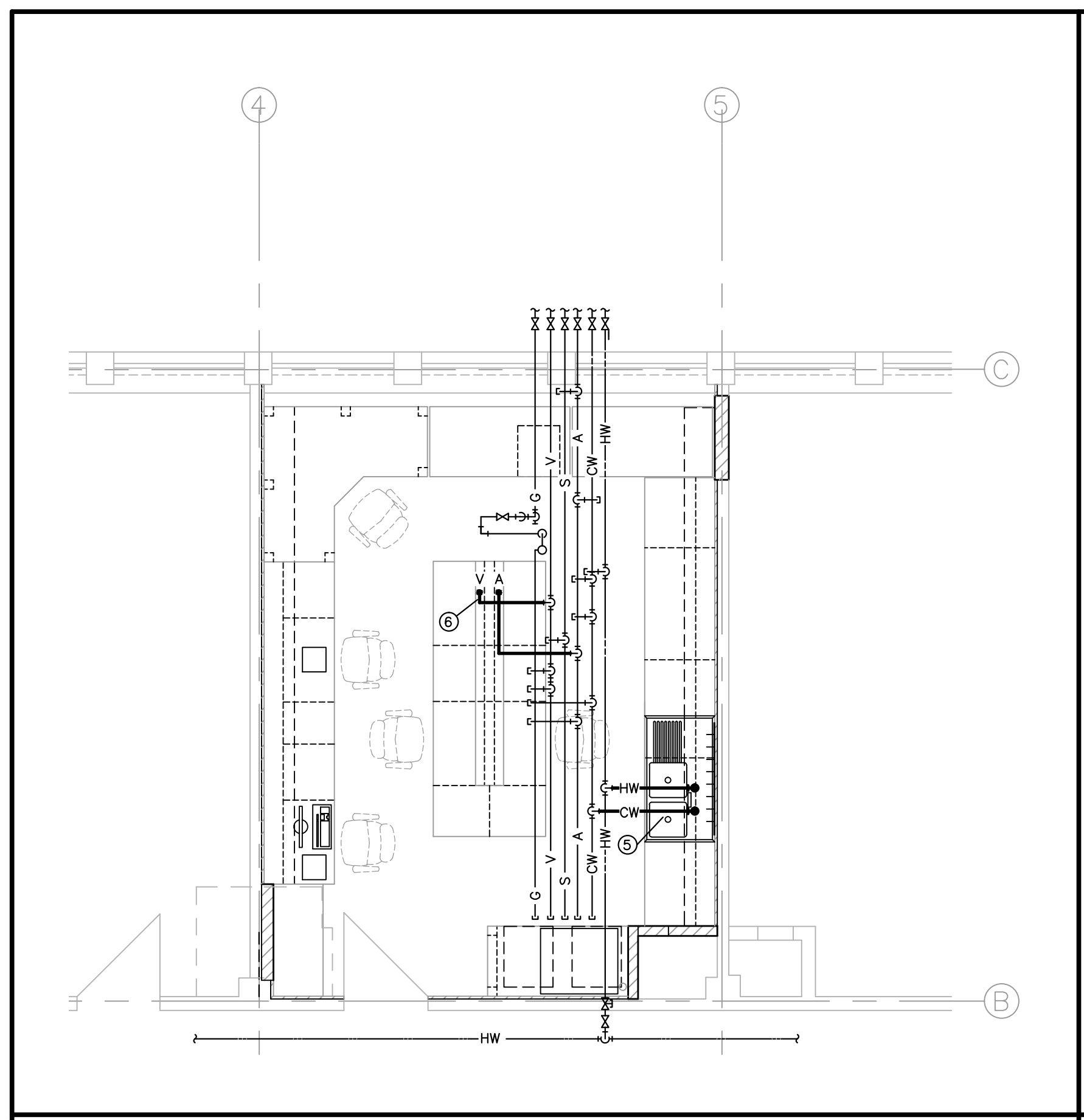
DURING THE DAY SCHEDULE, THE HOOD EXHAUST SHALL MAINTAIN VOLUMETRIC REQUIREMENTS TO SATISFY FACE VELOCITY CONDITIONS. IF THE HOOD SASH IS CLOSED BEYOND AN AREA REPRESENTATIVE OF THE MINIMUM VENTILATION OF THE SPACE, THE EXHAUST WILL NOT CONTINUE TO BE REDUCED. IF THE FACE VELOCITY EXCEEDS THE HIGH ALARM VALUE, THE ALARM LIGHT WILL BE ACTIVATED.

DURING THE NIGHT SCHEDULE, THE SUPPLY BOX WILL BE CLOSED AND THE HOOD EXHAUST WILL BE REDUCED TO A VALUE PREDICATED BY A REDUCTION IN THE FACE VELOCITY SETPOINT.

EXISTING LAB CONTROLS

SCALE: NTS

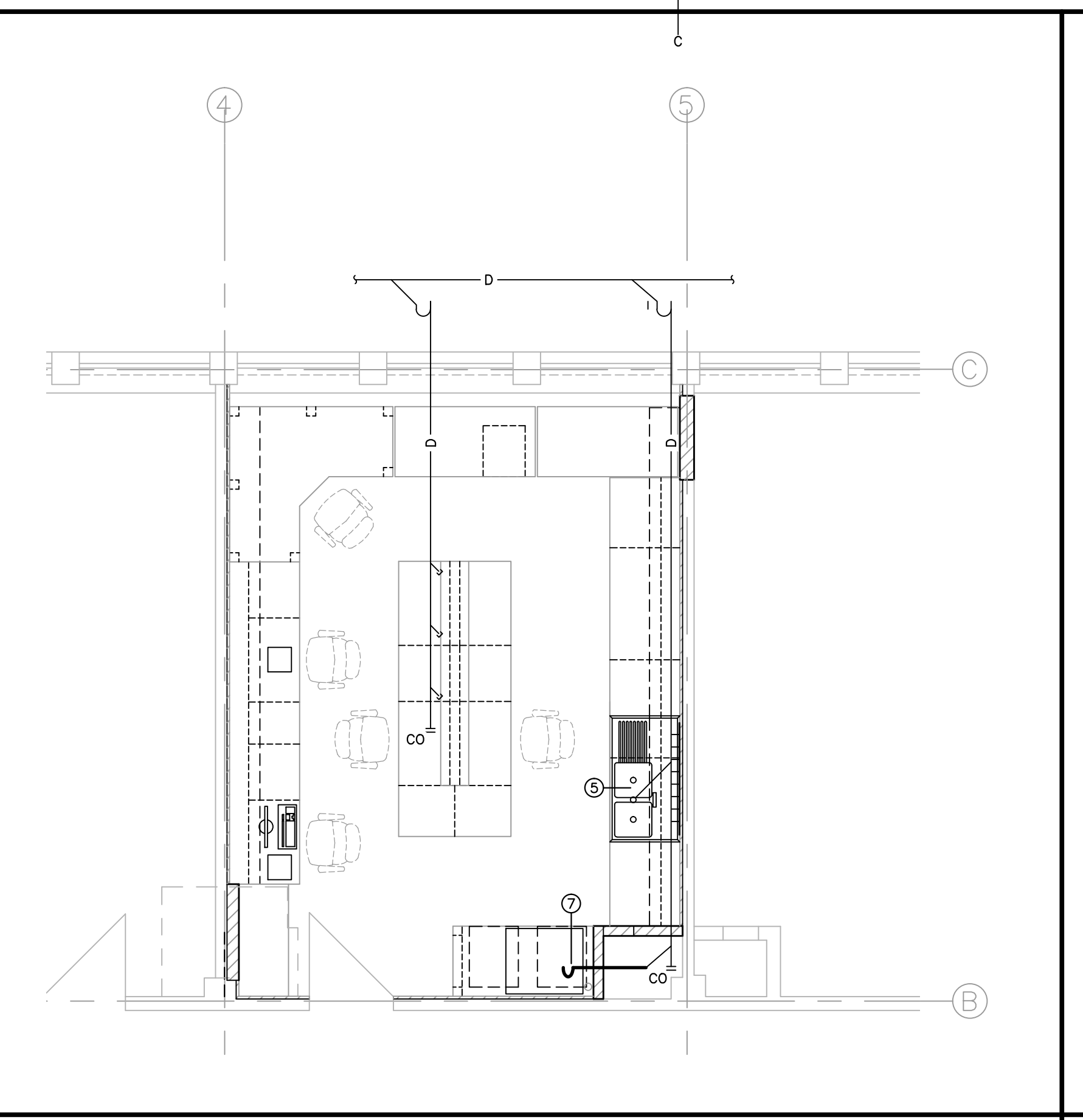




**ENTOMOLOGY DW AND GAS SERVICES
 NEW PLAN**

SCALE: 1:50
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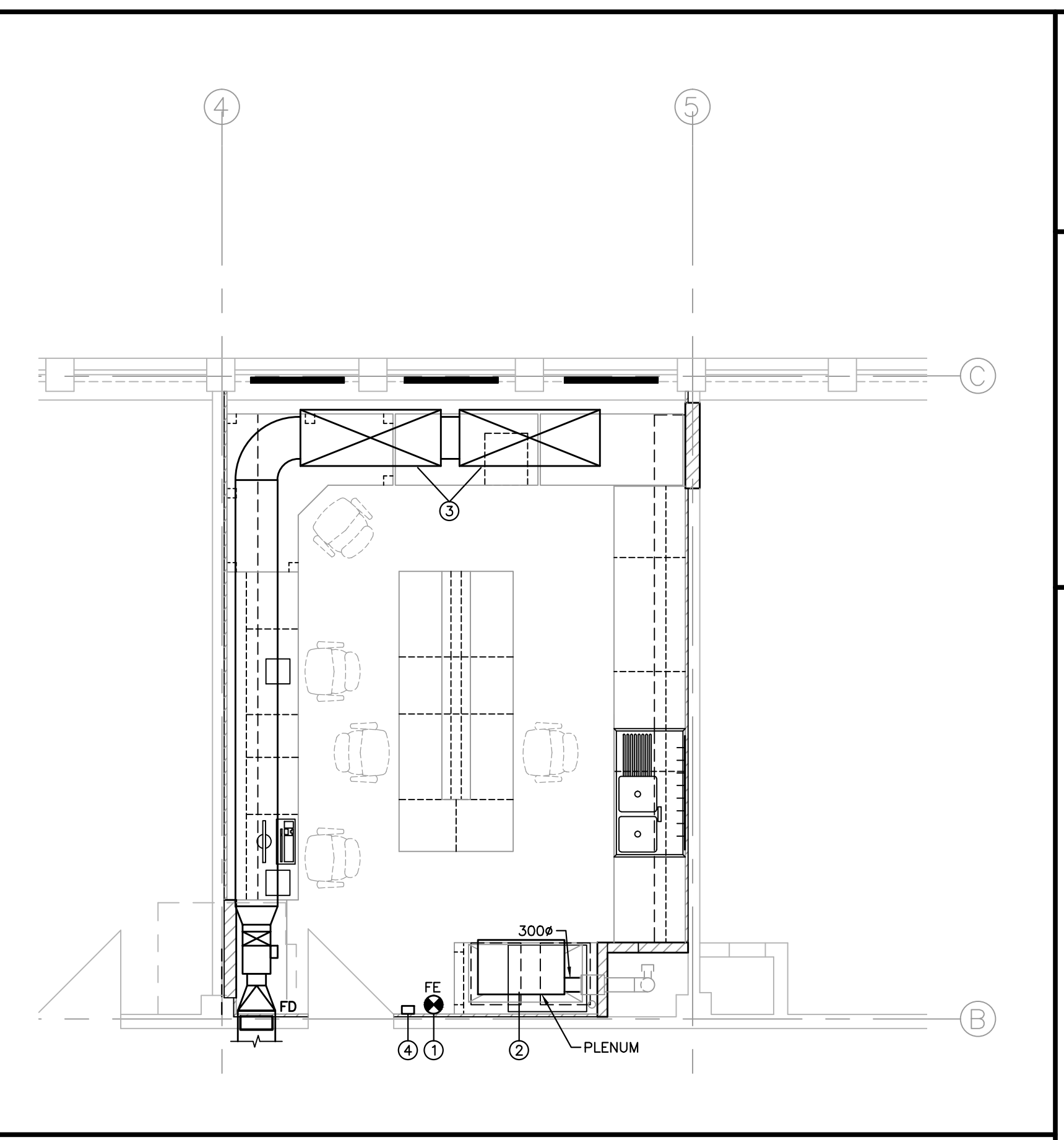
1
 M2 M2



ENTOMOLOGY DWV NEW PLAN

SCALE: 1:50
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2
 M2 M2



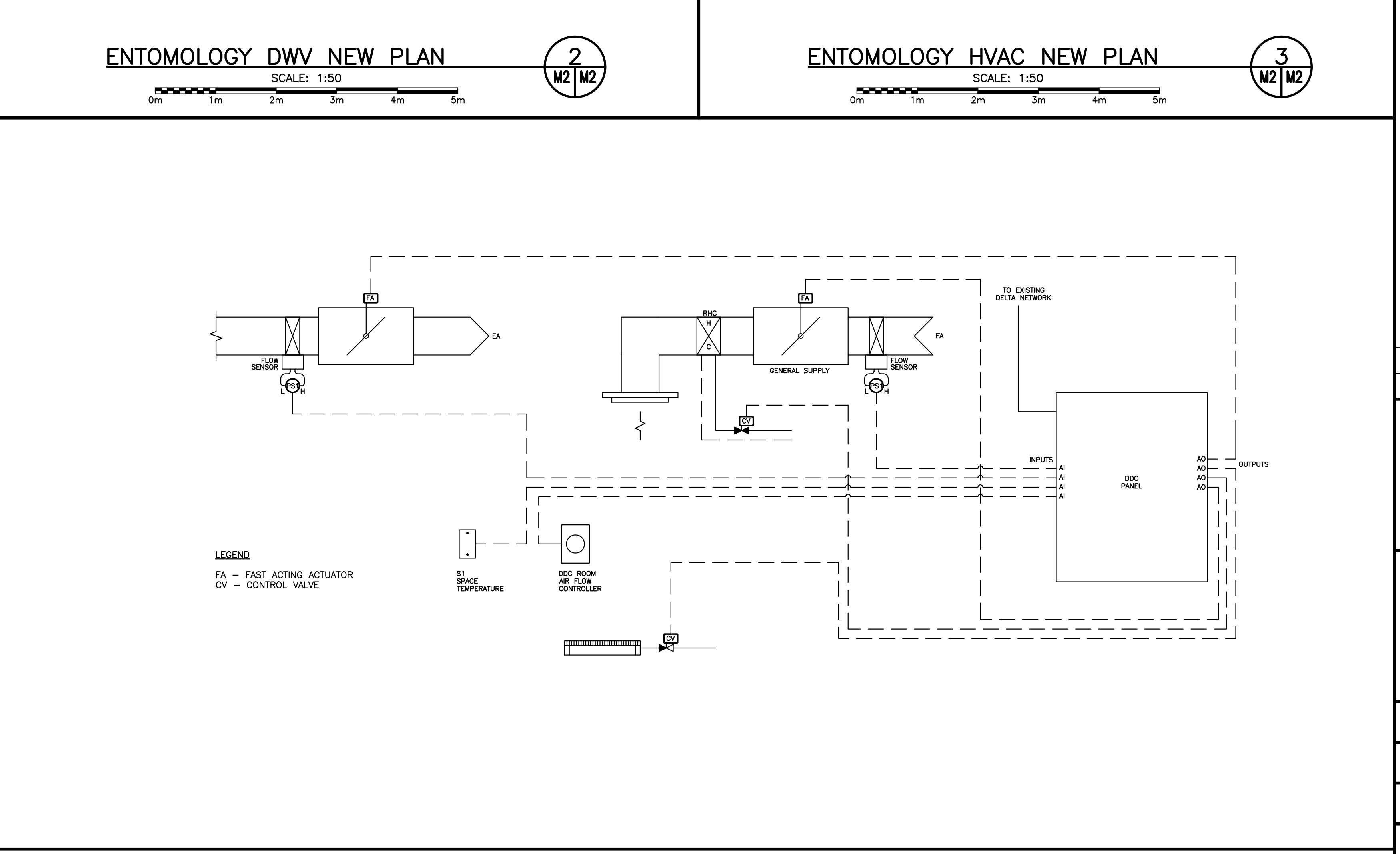
ENTOMOLOGY HVAC NEW PLAN

SCALE: 1:50
 0m 1m 2m 3m 4m 5m

3
 M2 M2

NEW NOTES:

- ① REINSTALL EXISTING FIRE EXTINGUISHER. EXACT LOCATION TO BE FIELD COORDINATED WITH DEPARTMENTAL REPRESENTATIVE.
- ② INSTALL NEW STAINLESS STEEL EXHAUST AIR DUCT, 600L X 500H X 600D 16 GAUGE SS PURPOSE MADE PLENUM AND REGISTER. REGISTER TO BE 600 X 500 EH PRICE MODEL 5305 WITH FIXED LOUVERS, 45 DEGREE ANGLE, STEEL REGISTER, COMPLETE WITH STEEL DAMPER, FIXED BLADES PARALLEL TO LONG DIMENSION, 19mm BLADE SPACING AND WHITE FINISH. CONFIRM EXACT REGISTER AND PLENUM SIZE IN THE FIELD.
- ③ REINSTALL EXISTING LAMINAR FLOW DIFFUSERS. EXTEND DUCT AS REQUIRED.
- ④ NEW DDC THERMOSTAT BY "CONTROL UPGRADE CONTRACTOR".
- ⑤ CONNECT NEW HOT AND COLD WATER TO NEW SINK AND FITTING SUPPLIED BY LAB FURNITURE MANUFACTURER. SINK FITTING INSTALLED BY MECHANICAL. COUNTERS ARE PREDRILLED BY LAB FURNITURE MANUFACTURER TO ACCEPT FITTING. CONNECT NEW SINK FITTING TO EXISTING HOT AND COLD WATER COMPLETE WITH CHROME PLATED COMPRESSION BALL VALVES COMPLETE WITH FLEXIBLE STAINLESS STEEL RISERS. CONNECT ACID DRAIN FOR BUILT-IN SINK TO EXISTING ACID DRAIN SYSTEM IN LAB. EXACT TIE-IN LOCATIONS TO BE FIELD COORDINATED. COORDINATE LOCATION OF FINAL CONNECTIONS WITH LAB FURNITURE MANUFACTURER APPROVED SHOP DRAWINGS.
- ⑥ INSTALL NEW VACUUM AND AIR PIPING FITTINGS. COUNTERS ARE PREDRILLED BY LAB FURNITURE MANUFACTURER TO ACCEPT FITTINGS. FITTINGS ARE PROVIDED BY LAB FURNITURE MANUFACTURER AND SHIPPED LOOSE WITH FURNITURE. CONNECT FITTINGS TO EXISTING AIR AND VACUUM SERVICE PIPES. EXACT TIE-IN LOCATIONS TO BE FIELD COORDINATED. COORDINATE LOCATION OF FINAL CONNECTIONS WITH LAB FURNITURE MANUFACTURER APPROVED SHOP DRAWINGS.
- ⑦ NEW ACID DRAIN & TRAP TO EXISTING GLASS ACID DRAIN BELOW FLOOR. PIPE CONDENSATE DRAIN FROM EQUIPMENT THIS AREA, INDIRECTLY TO TRAP. COORDINATE EXACT ROUTING IN THE FIELD.



NEW LAB CONTROLS

SCALE: NTS

4
 M2 M2

PIPING LEGEND

CW	DOMESTIC COLD WATER
HW	DOMESTIC HOT WATER
D	DRAINAGE LINE
G	GAS LINE
V	VACUUM LINE
S	STEAM LINE
A	AIR LINE
Valve Symbol	VALVE
CO	CLEANOUT
Cap Symbol	PIPE CAP

HVAC LEGEND

Box Symbol	EXISTING VAV BOX
Line Symbol	EXISTING INSULATED DUCTWORK
FE	EXISTING FIRE EXTINGUISHER
Line Symbol	EXISTING RADIATOR
Box Symbol	EXISTING SUPPLY AIR
Box Symbol	EXISTING SASH VOLUME CONTROL
Circle Symbol	EXISTING PNEUMATIC THERMOSTAT

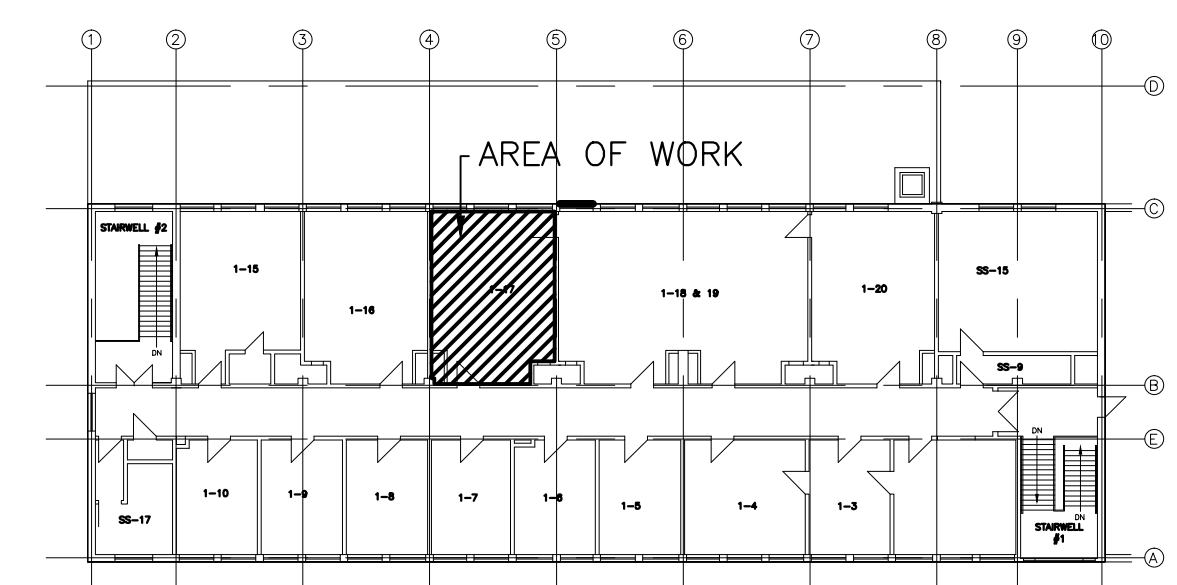
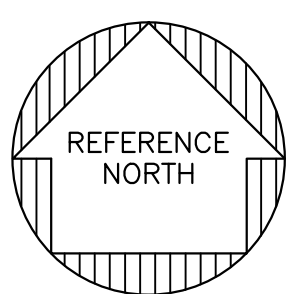
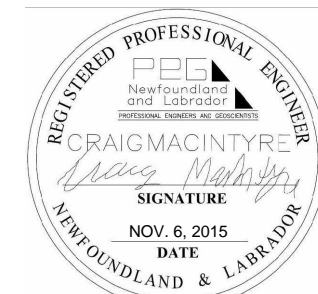
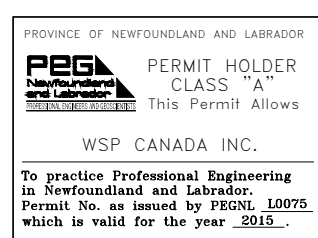
0	ISSUED FOR TENDER	NOV. 6 2015
revisions		date
project		projct

**ENTOMOLOGY LAB
 RETROFIT
 BUILDING #25
 BROOKFIELD ROAD
 ST. JOHN'S, NL**

**NEW
 LEVEL 1 PARTIAL
 FLOOR PLAN**

designed	R. JONES	conçu
date	NOV. 6, 2015	
drawn	A. TURNQUEST	dessiné
date	JULY 27, 2015	
approved		approuvé
date		
Tender		Soumission

PWGSC Project Manager	Administrateur de projets TPSGC
project number	no. du projet
1516-143310-P08	
drawing no.	no. du dessin
M2-R0	



KEY PLAN

SYMBOL	DESCRIPTION
	300x1200, RECESSED LED FIXTURE, 3800 LUMENS, 4100 COLOUR TEMPERATURE. PHILLIPS #AA248 OR EQUAL, 120V

POWER LEGEND	
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE 15A 125V, COMMERCIAL SPECIFICATION GRADE, 18" AFF COMPLETE WITH OFFICE WHITE NYLON FACE AND COVERPLATE. HUBBELL #BR150W OR EQUAL BY LEVITON.
	DUPLEX RECEPTACLE, 20A 125V. MOUNTED 18" AFF UNLESS NOTED OTHERWISE ON DRAWINGS.
	DIRECT CONNECTION - REFER TO EQUIPMENT SCHEDULE FOR CONNECTION DETAILS.
	DUPLEX RECEPTACLE INSTALLED BY MILLWORK CONTRACTOR AS PART OF THE MILLWORK PACKAGE. ELECTRICAL CONTRACTOR TO PROVIDE NEW WIRING BACK TO PANEL. 20A/120V

LIGHTING LEGEND	
SYMBOL	DESCRIPTION
	15A, 120V TOGGLE SWITCH, MOUNTED AT 48" AFF UNLESS NOTED OTHERWISE WHITE IN COLOR C/W WHITE COVERPLATE. HUBBELL #CSB1150W OR EQUAL BY LEVITON, COPPER.

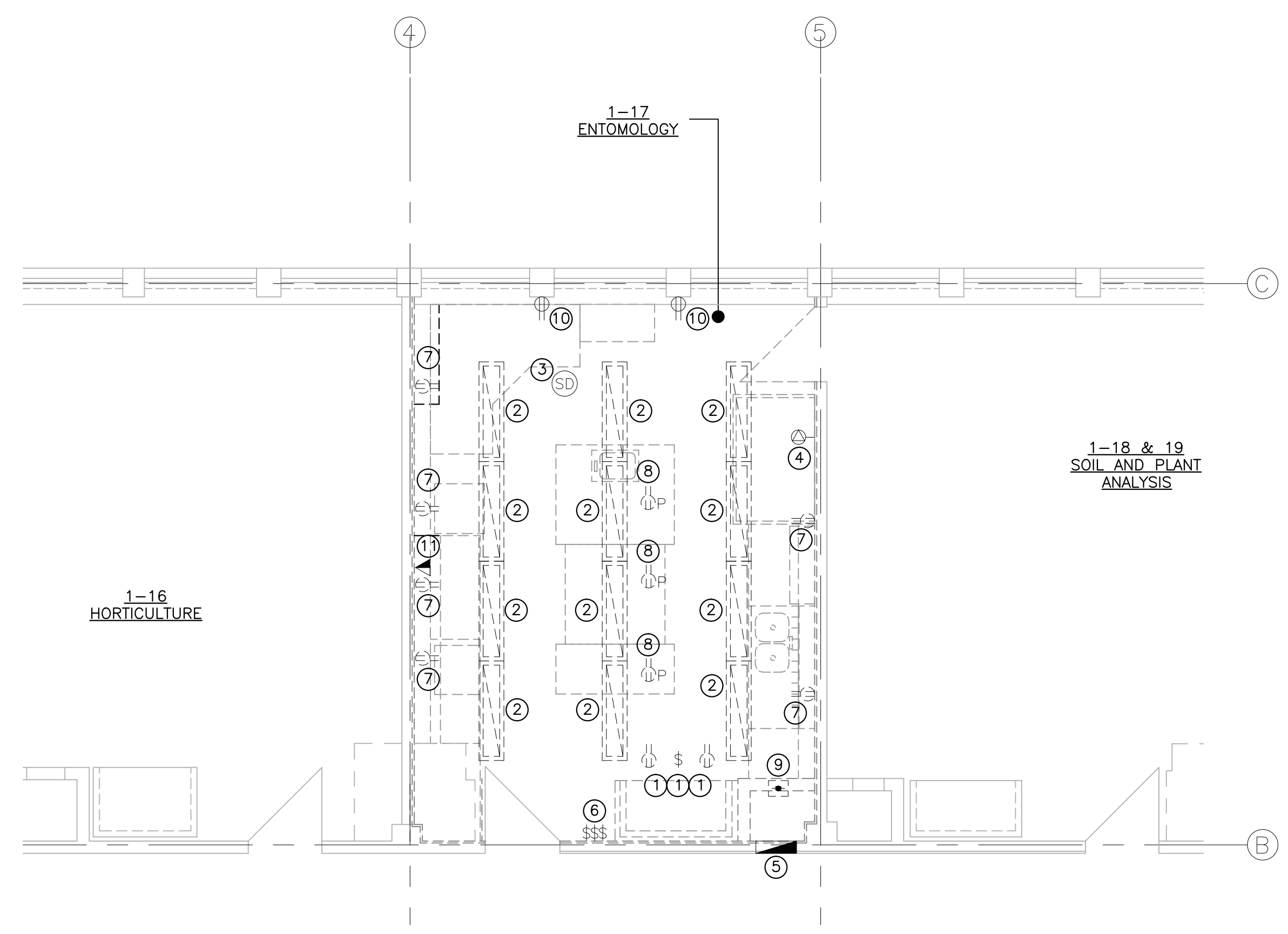
COMMUNICATIONS LEGEND	
SYMBOL	DESCRIPTION
	RJ45 CAT 5E MODULAR OUTLET MOUNTED AT 18" AFF UNLESS OTHERWISE NOTED. V - # OF VOICE D - # OF DATA

DEMOLITION KEY NOTES:

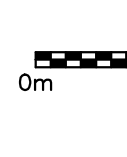
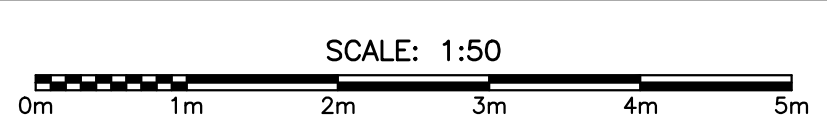
- ① DISCONNECT AND REMOVE POWER FOR EXISTING FUME HOOD.
- ② DISCONNECT AND REMOVE EXISTING LIGHTING.
- ③ DISCONNECT EXISTING SMOKE DETECTOR AND RE-INSTALL IN THE NEW CEILING.
- ④ DISCONNECT ALL WIRING ASSOCIATED WITH EXISTING PIECES OF EQUIPMENT.
- ⑤ EXISTING ELECTRICAL PANEL TO REMAIN.
- ⑥ DISCONNECT AND REMOVE EXISTING LIGHT SWITCHES.
- ⑦ DISCONNECT AND REMOVE ALL EXISTING RECEPTACLES.
- ⑧ POWER TO EXISTING ISLAND TO BE REMOVED. LEAVE EXISTING CONDUITS IN PLACE AND RE-USE WHERE POSSIBLE. EXISTING PEDESTAL RECEPTACLES TO BE REMOVED.
- ⑨ EXISTING JUNCTION BOX TO BE DISCONNECTED AND REMOVED. REMOVE ALL ABANDONED WIRE AND CONDUIT.
- ⑩ EXISTING RECEPTACLE BACK BOX AND CONDUIT TO REMAIN. PROVIDE NEW RECEPTACLE AND NEW WIRING BACK TO PANEL.
- ⑪ DISCONNECT EXISTING DATA AND TELEPHONE OUTLET. REUSE EXISTING LINES AND PROVIDE BACK BOX, CONDUIT AND FACEPLATE IN NEW WALL.

GENERAL DEMOLITION NOTES:

- DISCONNECT AND REMOVE ALL ABANDONED WIRING AND CONDUITS BACK TO SOURCE.
- UNLESS OTHERWISE NOTED THIS CONTRACTOR IS RESPONSIBLE TO DISPOSE OF ALL REMOVED EQUIPMENT

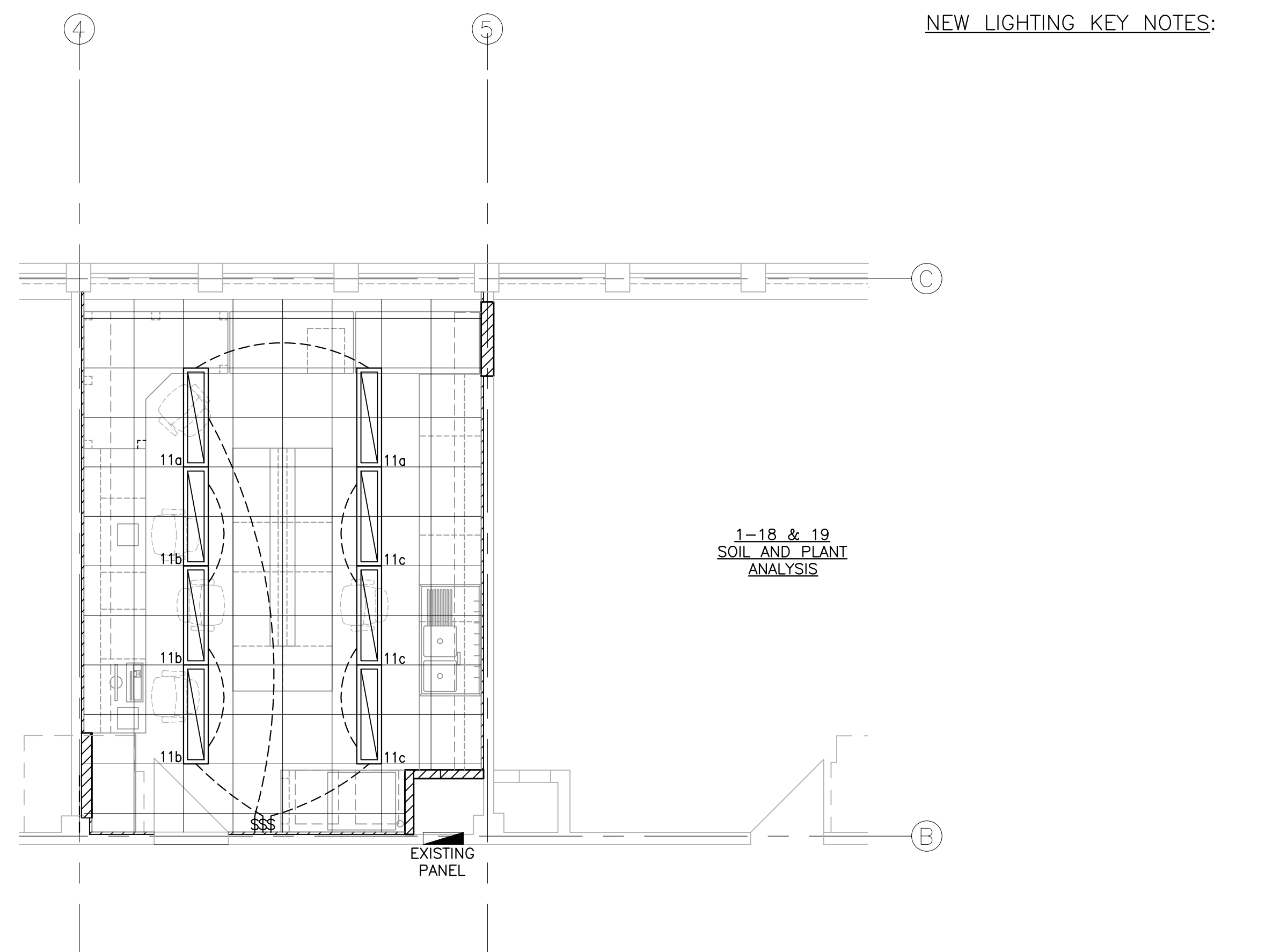


EXISTING/DEMOLITION LEVEL 1 PARTIAL FLOOR PLAN

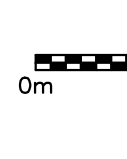
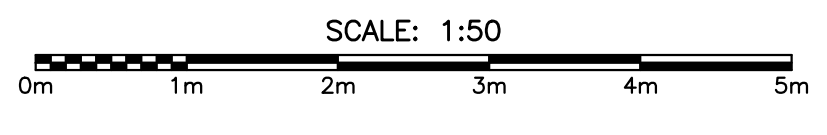


1
E1 | E1

NEW LIGHTING KEY NOTES:



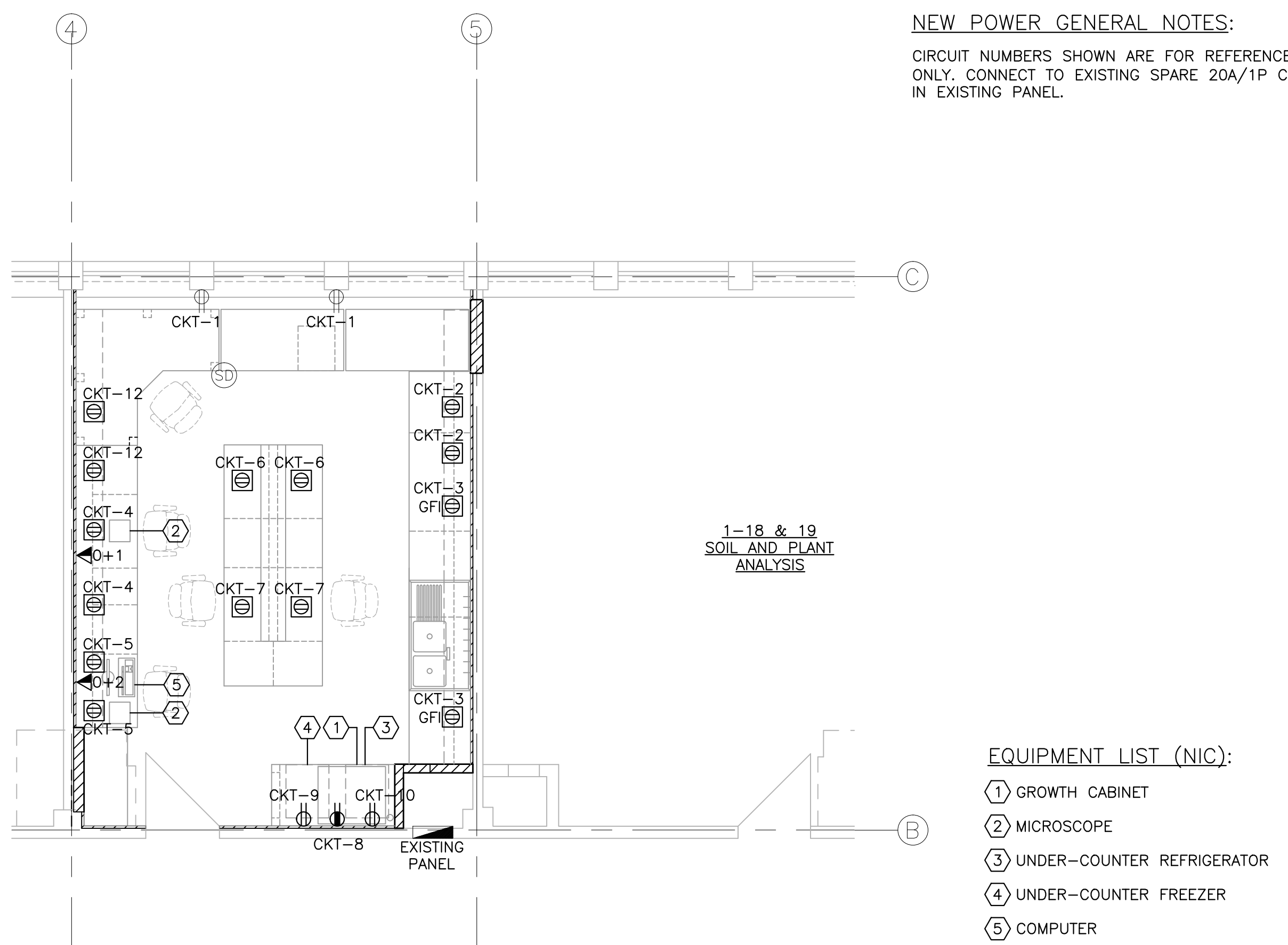
ENTOMOLOGY LAB NEW LIGHTING LAYOUT



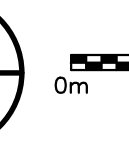
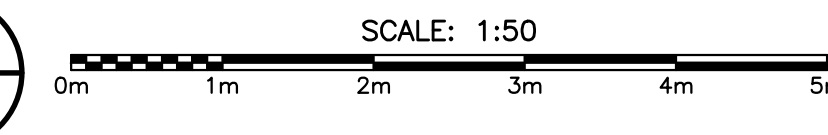
2
E1 | E1

NEW POWER GENERAL NOTES:

CIRCUIT NUMBERS SHOWN ARE FOR REFERENCE ONLY. CONNECT TO EXISTING SPARE 20A/1P CIRCUIT IN EXISTING PANEL.



ENTOMOLOGY LAB NEW POWER LAYOUT



3
E1 | E1

EQUIPMENT LIST (NIC):

- ① GROWTH CABINET
- ② MICROSCOPE
- ③ UNDER-COUNTER REFRIGERATOR
- ④ UNDER-COUNTER FREEZER
- ⑤ COMPUTER

0	ISSUED FOR TENDER	NOV. 6 2015
revisions		date

project ENTOMOLOGY LAB RETROFIT BUILDING #25 BROOKFIELD ROAD ST. JOHN'S, NL

EXISTING/DEMOLITION/NEW LEVEL 1 PARTIAL FLOOR PLAN

designed	C. MACINTYRE	conçu
date	NOVEMBER 6, 2015	
drawn	M. KAMPHUIS	dessiné
date	SEPTEMBER 25, 2015	
approved		approuvé
date		
Tender		Soumission

PWGSC Project Manager / Administrateur de projets TPSGC
project number / no. du projet
1516-143310-P08

drawing no. / no. du dessin
E1-R0



Appendix "F"

INSURANCE TERMS

INSURANCE TERMS

IN1 GENERAL

- IN1.1 Worker's Compensation
- IN1.2 Indemnification
- IN1.3 Proof of Insurance
- IN1.4 Insured
- IN1.5 Payment of Deductible

IN2 COMMERCIAL GENERAL LIABILITY

- IN2.1 Scope of Policy
- IN2.2 Period of Insurance

IN3 AUTOMOBILE INSURANCE

- IN3.1 Scope of Policy

IN4 BUILDER'S RISK / INSTALLATION FLOATER

- IN4.1 Scope of Policy
- IN4.2 Amount of Insurance
- IN4.3 Period of Insurance
- IN4.4 Insurance Proceeds

IN1 GENERAL

IN1.1 Worker's Compensation

- 1) The Contractor shall provide and maintain Worker's Compensation Insurance in accordance with the legal requirements of the Province or Territory where the work is being carried out.

IN1.2 Indemnification

- 1) The insurance required by the provisions of these Insurance Terms shall in no way limit the Contractor's responsibility under the Indemnification clause of the General Conditions of the contract. Any additional coverage the Contractor may deem necessary to fulfill his obligations under the aforesaid clause shall be at his own discretion and expense.

IN1.3 Proof of Insurance

- 1) Before commencement of the Work, and within thirty (30) days after acceptance of its bid, the Contactor shall deposit with Canada a CERTIFICATE OF INSURANCE (form AAFC / AAC5314) available upon request.
- 2) Upon request by Canada, the Contractor shall provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the provisions contained herein.

IN1.4 Insured

- 1) Each policy shall insure the Contractor and shall include Her Majesty the Queen in right of Canada, represented by the Minister of Agriculture & Agri-Food Canada as an additional Insured, with respect

INSURANCE TERMS (Continued)

IN1.5 Payment of Deductible

- 1) The payment of monies up to the deductible amount made in satisfaction of a claim shall be borne by the Contractor.

IN2 COMMERCIAL GENERAL LIABILITY

IN2.1 Scope of Policy

- 1) The insurance coverage provided shall not be less than that provided by IBC Form 2100, as amended from time to time, and shall have:
 - (a) an Each Occurrence Limit of not less than \$5,000,000.00 ;
 - (b) a Products/Completed Operations Aggregate Limit of not less than \$5,000,000.00 ; and
 - (c) a General Aggregate Limit of not less than \$10,000,000.00 per policy year, if the policy is subject to such a limit.
- 2) The policy shall either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:
 - (a) Blasting.
 - (b) Pile driving and caisson work.
 - (c) Underpinning.
 - (d) Removal or weakening of support of any building or land whether such support be natural or otherwise if the work is performed by the insured contractor.
 - (e) Asbestos.
 - (f) Non-owed Automobile Policy.

IN2.2 Period of Insurance

- 1) Unless otherwise directed in writing by Canada, or, otherwise stipulated elsewhere herein, the policy required herein shall be in force and be maintained from the date of contract award until the day of issue of the Certificate of Completion except that the coverage for Completed Operations Liability shall, in any event, be maintained for a period of at least six (6) years beyond the date of the CERTIFICATE OF SUBSTANTIAL PERFORMANCE.

IN3 AUTOMOBILE INSURANCE

IN3.1 Scope of Policy

- 1) Automobile Liability Insurance in respect of licensed vehicles shall have limits of not less than one

INSURANCE TERMS (Continued)

IN4 BUILDER'S RISK / INSTALLATION FLOATER

IN4.1 Scope of Policy

- 1) The insurance coverage provided by a Builder's Risk policy or an Installation Floater policy shall not be less than that provided by IBC Forms 4042 and 4047, as amended from time to time.
- 2) The policy shall permit use and occupancy of the project, or any part thereof, where such use and occupancy is for the purposes for which the project is intended upon completion.
- 3) The policy may exclude or be endorsed to exclude coverage for loss or damage caused by any of the following:
 - (a) Asbestos.
 - (b) Fungi or spores.
 - (c) Cyber.
 - (d) Terrorism.

IN4.2 Amount of Insurance

- 1) The amount of insurance shall not be less than the sum of the contract value plus the declared value (if any) set forth in the contract documents of all material and equipment supplied by Canada at the site of the project to be incorporated into and form part of the finished Work. If the value of the Work is changed, the policy shall be changed to reflect the revised contract value.

IN4.3 Period of Insurance

- 1) Unless otherwise directed in writing by Canada, or, stipulated elsewhere herein, the policy required herein shall be in force and be maintained from prior to the commencement of work until the day of issue of the CERTIFICATE OF SUBSTANTIAL PERFORMANCE.

IN4.4 Insurance Proceeds

- 1) The policy shall provide that the proceeds thereof are payable to Her Majesty or as Canada may direct in accordance with
- 2) The Contractor shall, without delay, do such things and execute such documents as are necessary to effect payment of the proceeds.



Appendix "G"

CONTRACT DOCUMENTS

MAJOR WORKS - CONTRACT DOCUMENTS

SC01 CONTRACT DOCUMENTS

- 1) The following are the contract documents:
 - (a) Contract page when signed by Canada;
 - (b) Duly completed Bid and Acceptance Form and any Appendices attached thereto;
 - (c) Drawings and Specifications;
 - (d) AAFC General Conditions form AAFC / AAC5321-E:
 - (i) GC1 General Provisions
 - (ii) GC2 Administration of the Contract
 - (iii) GC3 Execution and Control of the Work
 - (iv) GC4 Protective Measures
 - (v) GC5 Terms of Payment
 - (vi) GC6 Delays and Changes in the Work
 - (vii) GC7 Default, Suspension or Termination of Contract
 - (viii) GC8 Dispute Resolution
 - (ix) GC9 Contract Security
 - (x) GC10 Insurance
 - (e) Supplementary Conditions, if any;
 - (f) Insurance Terms form AAFC / AAC5315-E;
 - (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 language of the contract documents shall be the language of the Bid and Acceptance Form submitted.

SC02 ACCEPTANCE AND CONTRACT

- 1) Upon acceptance of the Contractor's offer by Canada, a binding Contract shall be formed between Canada and the Contractor. The documents forming the Contract shall be the contract documents referred to in SC01 CONTRACT DOCUMENTS.



Appendix "H"

CONTRACT

CONTRACT

PURCHASING OFFICE

Agriculture and Agri-Food Canada
 Eastern Service Centre
 Tender Receiving Unit
 2001 Robert-Bourassa Boulevard, Suite 671-TEN
 Montréal, Quebec
 H3A 3N2

Your tender is accepted to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the construction listed herein and on any attached sheets at the price or prices set out therefor.

Comments

Vendor / Firm Name and Address

Title		
Solicitation / Contract No.		Date
Client Reference No.		
File No.		
Financial Code(s)		<input type="radio"/> GST <input type="radio"/> HST <input type="radio"/> QST
F.O.B Destination		
Applicable Taxes Included		
Destination		
Invoices - Original and two copies to be sent to :		
Address Enquiries to:		
Telephone No.	Ext.	Fax No.
Total Estimated Cost	Currency Type CAD	
For the Minister		
Signature _____		Date _____



FORMS

- Bid Bond
- Certificate of Insurance
- Labour and Material Payment Bond
- Performance Bond
- T4-A Certification
- Personnel Screening, Consent and Authorization Form

BID BOND

BOND NUMBER: _____

AMOUNT: _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,
hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Oblige, hereinafter called the Crown, in the amount of

_____ dollars (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__.

WHEREAS, the Principal has submitted a written tender to the Crown, dated the _____ day of _____, 20__,

for _____

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that if:

- (a) the Principal, should his tender be accepted within the period specified by the Crown, or, if no period be specified, within sixty (60) days after closing date of the tender, does execute within a period specified by the Crown, or, if no period be specified therein, within fourteen (14) days after the prescribed forms are presented to him for signature, execute such further contractual documents, if any, as may be required by the terms of the tender as accepted, and does furnish a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Contract price and satisfactory to the Crown, or other security acceptable to the Crown, or
- (b) the Principal does pay to the Crown the difference between the amount of the Principal's tender and the amount of the Contract entered into by the Crown for the work, supplies and services which were specified in the said tender, if the latter amount be in excess of the former,

then this obligation shall be void; otherwise it shall remain in full force and effect.

PROVIDED, HOWEVER, that the Surety and the Principal shall not be liable to the Crown for an amount greater than the amount specified in this bond.

PROVIDED FURTHER that the Surety shall not be subject to any suit or action unless such suit or action is instituted and process therefore served upon the Surety at its Head Office in Canada, within twelve (12) months from the date of this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal

Witness

Surety

Note: Affix Corporate seal if applicable.

CERTIFICATE OF INSURANCE

To be completed by the Insurer

CONTRACT					
Description and location of work					Contract No.
					Project No.
INSURER			BROKER		
Company name			Company name		
Unit/Suite/Apt.	Street number	Number suffix	Unit/Suite/Apt.	Street number	Number suffix
Street name			Street name		
Street type	Street direction	PO Box or Route Number	Street type	Street direction	PO Box or Route Number
Municipality (City, Town, etc.)			Municipality (City, Town, etc.)		
Province/State	Postal/ZIP code		Province/State	Postal/ZIP code	
INSURED			ADDITIONAL INSURED		
Contractor name			Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food Canada.		
Unit/Suite/Apt.	Street number	Number suffix			
Street name					
Street type	Street direction	PO Box or Route Number			
Municipality (City, Town, etc.)					
Province/State	Postal/ZIP code				
This insurer certifies that the following policies of insurance are at present in force covering all operations of the Insured, in connection with the contract made between the named insured and Her Majesty the Queen in right of Canada, represented by the Minister of Agriculture and Agri-Food Canada.					
POLICY					
Type	Number	Inception date	Expiry date	Limit of liability (\$)	
Commercial General Liability					
Builder's Risk "All Risks"					
Installation Floater "All Risks"					
Other (list)					
Each of these policies includes the coverages and provisions as specified in Insurance Terms and each policy has been endorsed to cover Her Majesty as an Additional Insured. The Insurer agrees to notify Her Majesty and the Named insured in writing thirty (30) days prior to any material change in, or cancellation of any policy or coverage.					
Name of Insurer's Officer or Authorized Employee		Telephone number		Ext.	
Signature		Date			

LABOUR AND MATERIAL PAYMENT BOND

BOND NUMBER: _____

AMOUNT: _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,
hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Obligee, hereinafter called the Crown, in the amount of

_____ dollars (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__

WHEREAS, the Principal has entered into a Contract with the Crown dated the _____ day of _____, 20__,
for _____

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that, if payment is promptly made to all Claimants who have performed labour or services or supplied material in connection with the Contract and any and all duly authorized modifications and extensions of the Contract that may hereafter be made, notice of which modifications and extensions to the Surety being hereby waived, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. For the purpose of this bond, a Claimant is defined as one having a direct contract with the Principal or any Sub-Contractor of the Principal for labour, material or both, used or reasonably required for use in the performance of the Contract, labour and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone services or rental of equipment (but excluding rental of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract.
2. For the purpose of this Bond, no payment is required to be made in respect of a claim for payment for labour or services performed or material supplied in connection with the Contract that represents a capital expenditure, overhead or general administration costs incurred by the Principal during the currency or in respect of the Contract.
3. The Principal and the Surety hereby jointly and severally agree with the Crown that if any Claimant has not been paid as provided for under the terms of his contract with the Principal or a Sub-Contractor of the Principal before the expiration of a period of ninety (90) days after the date on which the last of such Claimant's labour or service was done or performed or materials were supplied by such Claimant, the Crown may sue on this bond, have the right to prosecute the suit to final judgment for such sum or sums as may be due and have execution thereon; and such right of the Crown is assigned by virtue of Part VIII of the *Financial Administration Act* to such Claimant.
4. For the purpose of this bond the liability of the Surety and the Principal to make payment to any claimant not having a contract directly with the Principal shall be limited to that amount which the Principal would have been obliged to pay to such claimant had the provisions of the applicable provincial or territorial legislation on lien or privileges been applicable to the work. A claimant need not comply with provisions of such legislation setting out steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which the claimant might have had. Any such claimant shall be entitled to pursue a claim and to recover judgment hereunder subject to the terms and notification provisions of the Bond.
5. Any material change in the Contract between the Principal and the Crown shall not prejudice the rights or interest of any Claimant under this Bond who is not instrumental in bringing about or has not caused such change.

6. No suit or action shall be commenced hereunder by any Claimant:

- (a) Unless such Claimant shall have given written notice within the time limits hereinafter set forth to the Principal and the Surety above named, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to the Principal and the Surety at any place where an office is regularly maintained for the transaction of business by such persons or served in any manner in which legal process may be served in the Province or other part of Canada in which the subject matter of the Contract is located. Such notice shall be given
 - (i) in respect of any claim for the amount or any portion thereof required to be held back from the Claimant by the Principal or by the Sub-Contractor of the Principal under either the terms of the Claimant's Contract with the Principal or the Claimant's Contract with the Sub-Contractor of the Principal within one hundred and twenty (120) days after such Claimant should have been paid in full under this Contract;
 - (ii) in respect of any claim other than for the holdback or portion thereof referred to above within one hundred and twenty (120) days after the date upon which such Claimant did or performed the last of the service, work or labour or furnished the last of the materials for which such claim is made under the Claimant's Contract with the Principal or a Sub-Contractor of the Principal;
- (b) After the expiration of one (1) year following the date on which the Principal ceased work on the said Contract, including work performed under the guarantees provided in the Contract;
- (c) Other than in a court of competent jurisdiction in the province or district of Canada in which the subject matter of the Contract or any part thereof is situated and not elsewhere, and the parties hereto hereby agree to submit to the jurisdiction of such court.

7. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

8. The Surety shall not be entitled to claim any moneys relating to the Contract and the liability of the Surety under this Bond shall remain unchanged and, without restricting the generality of the foregoing, the Surety shall pay all valid claims of Claimants under this Bond before any moneys relating to the Contract held by the Crown are paid to the Surety by the Crown.

9. The Surety shall not be liable for a greater sum than the amount specified in this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal

Witness

Surety

Note: Affix Corporate seal if applicable.

PERFORMANCE BOND

BOND NUMBER: _____

AMOUNT: _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,
hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Obligee, hereinafter called the Crown, in the amount of

_____ dollars (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__.

WHEREAS, the Principal entered into a Contract with the Crown dated the _____ day of _____, 20__,
for _____

which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that, if the Principal shall well and faithfully observe and perform all the obligations on the part of the Principal to be observed and performed in connection with the Contract, then this obligation shall be void, otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. Whenever the Principal shall be, and declared by the Crown to be, in default under the Contract, the Surety shall:
 - (a) if the work is not taken out of the Principal's hands, remedy the default of the Principal,
 - (b) if the work is taken out of the Principal's hands and the Crown directs the Surety to undertake the completion of the work, complete the work in accordance with the Contract provided that if a contract is entered into for the completion of the work,
 - (i) it shall be between the Surety and the completing contractor, and
 - (ii) the selection of such completing contractor shall be subject to the approval of the Crown,
 - (c) if the work is taken out of the Principal's hands and the Crown, after reasonable notice to the Surety, does not direct the Surety to undertake the completion of the work, assume the financial responsibility for the cost of completion in excess of the moneys available to the Crown under the Contract,
 - (d) be liable for and pay all the excess costs of completion of the Contract, and
 - (e) not be entitled to any Contract moneys earned by the Principal, up to the date of his default on the Contract and any holdbacks relating to such earned Contract moneys held by the Crown, and the liability of the Surety under this Bond shall remain unchanged provided, however, and without restricting the generality of the foregoing, upon the completion of the Contract to the satisfaction of the Crown, any Contract moneys earned by the Principal or holdbacks related thereto held by the Crown may be paid to the Surety by the Crown.
2. The Surety shall not be liable for a greater sum than the amount specified in this Bond.
3. No suit or action shall be instituted by the Crown herein against the Surety pursuant to these presents after the expiration of two (2) years from the date on which final payment under the Contract is payable.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal

Witness

Surety

Note: Affix Corporate seal if applicable.



T4-A CERTIFICATION

The Contractor shall complete and submit this T4-A Certification within fourteen (14) calendar days of Notification of Contract award and within fourteen (14) calendar days immediately following any change to the information already provided under the Contract. Failure to provide this information or failure to provide the correct information shall result in a fundamental breach of the Contract.

1. The Contractor shall enter a [x] in one of the boxes below opposite the description that best describes its status.

- [] A business incorporated either federally or provincially;
[] An unincorporated business, either as a sole proprietor or a partnership; or
[] An individual.

Note: The information provided in Section 2 must correspond with that provided in Section 1.

Corporate or unincorporated business or individual's name: _____

Street Name or Box #: _____

City, Town or Village: _____

Province: _____

Postal Code: _____

2. Contractor shall complete Section 2(a) or 2(b) or 2(c), whichever is applicable to its situation.

(a) If incorporated:

Business Number (BN): _____, or
GST / HST Number: _____, or
T2 Corporation Tax Number (T2N): _____, whichever is applicable

(b) If unincorporated:

Social Insurance Number (SIN): _____, and
Business Number (BN): _____, or
GST / HST Number: _____, whichever is applicable

Note: The Unincorporated Business Name must be the same as the name associated with the Revenue Canada Business Number or the GST Number.

(c) If individual:

Social Insurance Number (SIN): _____, and
Business Number (BN): _____, or
GST / HST Number: _____, whichever is applicable

Note: The Individual's Name must be the same as the name associated with the Social Insurance Number.

3. WE HEREBY CERTIFY that I/We have examined the information provided above, including the legal name, address and Revenue Canada identifier (SIN, BN, GST / HST No., T2N), as applicable, and that it is correct and complete, and fully discloses my/our identification.

Contractor's signature Title of Signatory Date



PERSONNEL SCREENING, CONSENT AND AUTHORIZATION FORM

OFFICE USE ONLY		
Reference number	Department/Organization number	File number

NOTE: For Privacy Act Statement refer to Section C of this form and for completion instructions refer to attached instructions. Please typewrite or print in block letters.

A ADMINISTRATIVE INFORMATION (To be completed by the Authorized Departmental/Agency/Organizational Official)

New
 Update
 Upgrade
 Transfer
 Supplemental
 Re-activation

The requested level of reliability/security check(s)

Reliability Status
 Level I (CONFIDENTIAL)
 Level II (SECRET)
 Level III (TOP SECRET)

Other _____

PARTICULARS OF APPOINTMENT/ASSIGNMENT/CONTRACT

Indeterminate
 Term
 Contract
 Industry
 Other (specify secondment, assignment, etc.) _____

Justification for security screening requirement

Position/Competition/Contract number	Title	Group/Level (Rank if applicable)	
Employee ID number/PRI/Rank and Service number (if applicable)	If term or contract, indicate duration period ▶	From	To
Name and address of department / organization / agency	Name of official	Telephone number ()	Facsimile number ()

B BIOGRAPHICAL INFORMATION (To be completed by the applicant)

Surname (Last name) _____ Full given names (no initials) underline or circle usual name used _____ Family name at birth _____

All other names used (i.e. Nickname) _____

Sex: Male Female

Date of birth: Y | M | D _____ Country of birth _____ Date of entry into Canada if born outside Canada: Y | M | D _____

RESIDENCE (provide addresses for the last five years, starting with the most current)

Home address _____ Daytime telephone number () _____ E-mail address _____

1	Apartment number	Street number	Street name	Civic number (if applicable)	From Y M	To present
	City		Province or state	Postal code	Country	Telephone number ()

2	Apartment number	Street number	Street name	Civic number (if applicable)	From Y M	To Y M
	City		Province or state	Postal code	Country	Telephone number ()

Have you previously completed a Government of Canada security screening form? Yes No

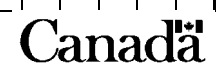
If yes, give name of employer, level and year of screening. _____ Y

CRIMINAL CONVICTIONS IN AND OUTSIDE OF CANADA (see instructions)

Have you ever been convicted of a criminal offence for which you have not been granted a pardon? Yes No

If yes, give details. (charge(s), name of police force, city, province/state, country and date of conviction) _____

Charge(s)	Name of police force	City
Province/State	Country	Date of conviction ▶ Y M D





INSTRUCTIONS FOR PERSONNEL SCREENING CONSENT AND AUTHORIZATION FORM TBS/SCT 330-23E (Rev. 2002/02)

Once completed, this form shall be safeguarded and handled at the level of Protected A.

General:

If space allotted in any portion is insufficient please use separate sheet using same format.

1. Section A (Administrative Information) Authorized Departmental/Agency/Organizational Official

The Official, based on instructions issued by the Departmental Security Officer, may be responsible for determining, based on five year background history, what constitutes sufficient verification of personal data, educational and professional qualifications, and employment history. References are to be limited to those provided on the application for employment or equivalent forms.

SUPPLEMENTAL INFORMATION REQUIREMENTS

Persons who presently hold a SECURITY CLEARANCE and subsequently marry, remarry or commence a common-law partnership, in addition to having to update sections of the *Security Clearance Form (TBS/SCT 330-60)*, are required to submit an original *Personnel Screening, Consent and Authorization Form*, with the following parts completed:

Part A - As set forth in each question

Part B - As set forth in each question, excluding CRIMINAL CONVICTIONS IN AND OUTSIDE OF CANADA.

Part C - Applicant's signature and date only are required

"Other". This should be used to identify if the security screening is for Site Access, NATO, SIGINT etc.

2. Section B (Biographical Information)

To be completed by the **applicant**. If more space is required use a separate sheet of paper. Each sheet must be signed.

Country of Birth - For "NEW" requests, if born abroad of Canadian parents, please provide a copy of your Certificate of Registration of Birth Abroad. If you arrived in Canada less than five years ago, provide a copy of the Immigration Visa, Record of Landing document or a copy of passport.

- List only criminal convictions for which a pardon has NOT been granted. Include on a separate attached sheet of paper, if more than one conviction. Applicant must include those convictions outside Canada.

- Offences under the *National Defence Act* are to be included as well as convictions by courts-martial are to be recorded.

3. Section C (Consent and Verification)

A copy of Section "C" may be released to institutions to provide acknowledgement of consent.

Criminal record checks (fingerprints may be required) and credit checks are to be arranged through the Departmental Security Office or the delegated Officer.

Consent: may be given only by an applicant who has reached the age of majority, otherwise, the signature of a parent or guardian is mandatory.

The age of majority is:

19 years in NFLD., N.S., N.B., B.C., Yukon, Northwest Territories and Nunavut;

18 years in P.E.I., Que., Ont., Man., Sask. and Alta.

The applicant will provide initials in the " applicant's initials box".

The official who carried out the verification of the information will print their name, insert their initials and telephone number in the required space.

- Reliability Screening (for all types of screening identified within Section A): complete numbers 1 and 2 and 3 if applicable.

- Security Clearance (for all types of screening identified within Section A): complete numbers 1 to 4 and 5 where applicable.

- Other: number 5 is used only where prior Treasury Board of Canada Secretariat approval has been obtained.

4. Section D (Review)

To be completed by authorized Departmental/Agency/Organizational Official who is responsible for ensuring the completion of sections A to C as requested.

5. Section E (Approval)

Authorized Departmental/Agency/Organizational Security Official refers to the individuals as determined by departments, agencies, and organizations that may verify reliability information and/or approve/not approve reliability status and/or security clearances. Approved Reliability Status and Level I, II and III, as well as the signature of the authorized security official or manager are added for Government of Canada use only. Applicants are to be briefed, acknowledge, and be provided with a copy of the "Security Screening Certificate and Briefing Form (TBS/SCT 330-47)".

Note: Private sector organizations do not have the authority to approve any level of security screening.

Photographs: Departments/Agencies/Organizations are responsible for ensuring that three colour photographs of passport size are attached to the form for the investigating agency. Maximum dimensions are 50mm x 70mm and minimum are 43mm x 54mm. The face length from chin to crown of head must be between 25mm x 35mm. The photographs must be signed by the applicant and an authorized security official. The photographs must have been taken within the last six months. It is required for new or upgrade Level III security clearances for identification of the applicant during the security screening investigation by the investigating agency. The investigating agency may in specific incidents request a photograph for a Level I or II clearances when an investigation is required.