



## INVITATION TO TENDER

**RETURN BIDS TO:**

**Bid Receiving / Agriculture and Agri-Food Canada**

Agriculture and Agri-Food Canada  
 Central Experimental Farm (CEF)  
 Bid Receiving (Main Entrance)  
 K.W. Neatby Building (#20)  
 960 Carling Avenue  
 Ottawa, Ontario K1A 0C6

**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
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Title Building 49 Washroom Retrofit	
Solicitation No. 15-1353	Date 2015-12-11
Client Reference No. A654	
File No. 15-1353	
Solicitation Closes: Monday, January 11, 2016, at 02:00 PM, EST.	
F.O.B <input type="radio"/> Plant <input checked="" type="radio"/> Destination <input type="radio"/> Other	
Address Enquiries to: Dave Carnegie	
Title: Project Officer	
Email: dave.carnegie@agr.gc.ca	
Telephone Number    Ext.	Fax Number
613 759-6877	
Destination Agriculture and Agri-Food Canada 960 Carling Ave. Building (#20) Ottawa, Ontario K1A 0C6	

**Instructions: See Herein**

Delivery Required	Delivery Offered
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

**ISSUING OFFICE**

Agriculture and Agri-Food Canada  
 CEF Integrated Services  
 K.W. Neatby Building (#20)  
 960 Carling Avenue  
 Ottawa, Ontario K1A 0C6



## SPECIAL INSTRUCTIONS TO BIDDERS (SI)

- SI01 Bid Documents
- SI02 Enquiries during the Solicitation Period
- SI03 Mandatory Site Visit
- SI04 Revision of Bid
- SI05 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 GI13 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 MANDATORY SITE VISIT

- 1) There will be a site visit on Monday,            December ,    21    , 2015 at  
10:00  AM  PM EST.

## **SPECIAL INSTRUCTIONS TO BIDDERS (Continued)**

Interested bidders are to meet at:

CEF Ottawa  
K.W. Neatby Building (#20)  
960 Carling Ave.  
Ottawa, Ontario K1A 0C5

The site visit for this project is MANDATORY. The representative of the bidder will be required to sign the Site Visit Attendance Sheet at the site visit. Bids submitted by Bidders who have not signed the attendance sheet will not be accepted.

### **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

### **SI05 BID RESULTS**

- 1) Following bid closing, bid results may be obtained from the bid receiving office by calling telephone number 613 759-1802 ext.

### **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.

## **SPECIAL INSTRUCTIONS TO BIDDERS (Continued)**

- 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.

### **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 one ( 1 ), 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&section=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.



## GENERAL INSTRUCTIONS TO BIDDERS

- GI01 Completion of Bid
- GI02 Identity or Legal Capacity of the Bidder
- GI03 Applicable Taxes
- GI04 Capital Development and Redevelopment Charges
- GI05 Registry and Pre-qualification of Floating Plant
- GI06 Listing of Subcontractors and Suppliers
- GI07 Bid Security Requirements
- GI08 Submission of Bid
- GI09 Revision of Bid
- GI10 Rejection of Bid
- GI11 Bid Costs
- GI12 Compliance with Applicable Laws
- GI13 Approval of Alternative Materials
- 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&section=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.



## 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.



**MAJOR WORKS – GENERAL CONDITIONS**

Page 1 of 54

**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**

- GC1.1 INTERPRETATION
  - GC1.1.1 Headings and References
  - GC1.1.2 Terminology
  - GC1.1.3 Application of Certain Provisions
  - GC1.1.4 Substantial Performance
  - GC1.1.5 Completion
- GC1.2 CONTRACT DOCUMENTS
  - GC1.2.1 General
  - GC1.2.2 Order of Precedence
  - GC1.2.3 Security and Protection of Documents and Work
- GC1.3 STATUS OF THE CONTRACTOR
- GC1.4 RIGHTS AND REMEDIES
- GC1.5 TIME OF THE ESSENCE
- GC1.6 INDEMNIFICATION BY THE CONTRACTOR
- GC1.7 INDEMNIFICATION BY CANADA
- GC1.8 LAWS, PERMITS AND TAXES
- GC1.9 WORKERS' COMPENSATION
- GC1.10 NATIONAL SECURITY
- GC1.11 UNSUITABLE WORKERS
- GC1.12 PUBLIC CEREMONIES AND SIGNS
- GC1.13 CONFLICT OF INTEREST
- GC1.14 AGREEMENTS AND AMENDMENTS
- GC1.15 SUCCESSION
- GC1.16 ASSIGNMENT
- GC1.17 NO BRIBE
- GC1.18 CERTIFICATION - CONTINGENCY FEES
- GC1.19 INTERNATIONAL SANCTIONS

**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&section=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&section=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&section=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.



## 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

### 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 Contractor 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 to liability arising out of the operations of the contractor with regard to the work.

#### 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.

## **INSURANCE TERMS (Continued)**

### **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-owned 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 million dollars inclusive per occurrence for bodily injury, death, and damage to property.

## BID AND ACCEPTANCE FORM

### CONSTRUCTION CONTRACT - MAJOR WORKS

<b>BA01 IDENTIFICATION</b>					
Description of the Work Building 49 Washroom Retrofit					
Solicitation Number 15-1353			File / Project Number A654		
<b>BA02 BUSINESS NAME AND ADDRESS OF BIDDER</b>					
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	
<b>BA03 THE OFFER</b>					
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) which consists of: (a) the Lump Sum of \$ _____ for the Work that is not designated in the Unit Price Table and therefore subject to a Lump Sum Arrangement; and, (b) the Total Estimated Amount of \$ _____ for the portion of the Work that is subject to a Unit Price Arrangement. (Amount transferred from Appendix 1 - Unit Price Table).					
2) Any errors in the extension of the Price per Unit and in the addition of the Estimated Total Prices in the Unit Price Table shall be corrected by Canada in order to obtain the Total Estimated amount.					
3) Any errors in the addition of the amounts in subparagraph 1)(a) and 1)(b) of BA03 shall be corrected by Canada to obtain the Total Bid Amount.					
<b>BA04 BID VALIDITY PERIOD</b>					
1) The bid shall not be withdrawn for a period of <u>30</u> days following the date of solicitation closing.					
<b>BA05 APPENDICES</b>					
1) The following appendices are included in this Bid and Acceptance Form: <input checked="" type="checkbox"/> Appendix 1					
<b>BA06 ACCEPTANCE AND CONTRACT</b>					
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.					
<b>BA07 CONSTRUCTION TIME</b>					
1) The Contractor shall perform and complete the Work within <u>10</u> weeks from the date of notification of acceptance of the offer.					
<b>BA08 BID SECURITY</b>					
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 1**

<b>UNIT PRICE TABLE</b>					
1) The Unit Price Table designates the Work to which a Unit Price Arrangement applies.					
2) The Price per Unit and the Estimated Total Price must be entered for each Item listed.					
Item No.	Class of Labour, Plant or Material	Unit of Measurement	Estimated Quantity	Price per Unit (Applicable Taxes extra)	Estimated Total Price (Applicable Taxes extra)
1	Pipe insulation containing asbestos	Linear M	1		
2	Pipe insulation fitting	Each	1		
TOTAL ESTIMATED AMOUNT (Transfer amount to subparagraph 1(b) of BA03)					





Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada

# **DRAWINGS AND SPECIFICATIONS**

**#15-1353**

**FOR**

## **RETROFIT OF WASHROOMS**

**Building 49**

**Project: A654**

**CENTRAL EXPERIMENTAL FARM (CEF)**

**Agriculture and Agri-Food Canada (AAFC)**

**960 Carling Avenue**

**Ottawa, Ontario K1A 0C6**

<u>Section</u>	<u>Title</u>	<u>Pages</u>
<b><u>INTERIOR DESIGN SPECIFICATIONS</u></b>		
<b>Division 01 – GENERAL CONDITIONS</b>		
01 33 00	Submittal Procedures.....	5
01 35 29	Health & Safety Requirements.....	4
01 45 00	Quality Control.....	3
01 61 00	Common Product Requirements.....	4
01 74 11	Cleaning.....	1
01 74 21	Waste Management.....	5
01 78 00	Closeout Submittals.....	7
<b>Division 02 – Existing Conditions</b>		
02 82 00.02	Asbestos Abatement Type 2 Operations.....	9
<b>Division 06 - WOOD, PLASTICS, AND COMPOSITES</b>		
06 10 00	Rough Carpentry.....	3
06 20 00	Finish Carpentry.....	3
06 40 00	Architectural Woodwork.....	6
06 47 00	Plastic Laminate Finishing.....	5
<b>Division 07 - THERMAL AND MOISTURE PROTECTION</b>		
07 21 13	Board Insulation.....	4
07 81 00	Applied Fireproofing.....	3
07 84 00	Firestopping.....	4
07 92 00	Joint Sealants.....	5
<b>Division 08 - OPENINGS</b>		
08 14 16	Flush Wood Doors.....	4
08 71 00	Door Hardware.....	6
08 71 73	Special Function Hardware.....	4
<b>Division 09 - FINISHES</b>		
09 21 16	Gypsum Board Assemblies.....	7
09 22 16	Non-structural Metal Framing.....	4
09 30 13	Ceramic Floor Tile.....	7
09 51 13	Acoustical Ceilings.....	3
09 91 23.01	Interior Re-Painting.....	14
09 91 23	Interior Painting.....	13
<b>Division 10 – SPECIALTIES</b>		
10 21 13.13	Metal Toilet Partitions.....	5
<b>Division 21 – FIRE SUPPRESSION</b>		
21 05 01	Mechanical General Requirements.....	6
<b>Division 22 - PLUMBING</b>		
22 11 16	Domestic Water Piping – Copper.....	3
22 13 18	Drainage Waste and Vent Piping – Plastic.....	2
22 42 01	Plumbing Specialties and Accessories.....	2
22 42 03	Plumbing Fixtures and Trim.....	3
<b>Division 23 - Heating, Ventilating and Air-Conditioning (HVAC)</b>		
23 05 23	Valves.....	2
23 05 29	Bases, Hangers and Supports.....	5
23 05 53.01	Mechanical Identification.....	4
23 05 93	Testing, Adjusting and Balancing (TAB) of Mechanical Systems.....	4
23 07 13	Thermal Insulation for Ducting.....	4

<u>Section</u>	<u>Title</u>	<u>Pages</u>
23 07 15	Thermal Insulation for Piping.....	5
23 09 43	Pneumatic Control System for HVAC.....	2
23 31 13.01	Ductwork Low Pressure - Metallic to 500 Pa.....	4
23 33 00	Duct Accessories.....	2
23 34 23	Commercial Fans.....	3
<b>Division 26 - ELECTRICAL</b>		
26 05 00	Electrical General Requirements.....	11
26 05 21	Conduit and Wire.....	5
26 24 01	Distribution Equipment Low Voltage.....	2
26 27 26	Wiring Devices.....	2
26 29 10	Motor Starters to 600 V.....	3
26 50 00	Lighting Equipment.....	3
26 52 00	Unit Equipment for Emergency Lighting.....	2
<b>Division 28 – ELECTRONIC SAFETY AND SECURITY</b>		
28 31 00	Fire Alarm Systems.....	3
<b>Drawings</b>		
ID-1	General notes and general arrangement plan	
ID-2	Equipment, demolition and partition plan – Ground Floor	
ID-3	Reflected ceiling and voice data power plan – Ground Floor	
ID-4	Floor and wall finishes plan – Ground Floor	
ID-5	Door, hardware, and wall section details – Ground Floor	
ID-6	Elevation, section and details – Floor (if multi-floor project)	
ID-7	Riser remove and reinstate coordination plans – Basement, Ground Floor and Second Floor	
M1	Mechanical legends, drawings list and schedule	
M2	Basement and ground floor – (East) - Plumbing demolition and new work	
M3	Ground and second floor – (East) – Plumbing and HVAC - Demolition and new work	
M4	Basement and ground floor – (West) - Plumbing demolition and new work	
M5	Ground and second floor – (West) - Plumbing and HVAC - Demolition and new work	
E1	Legend, key plan light fixture schedule and general notes	
E2	Ground floor - (East) – Power, lighting, demolition and new work	

END

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not applicable.

1.2 REFERENCES

.1 Not applicable.

1.3 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

1.4 SHOP DRAWINGS  
AND PRODUCT DATA

- .1 Refer to CCDC 2 GC 3.11.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario of Canada, if applicable
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .5 Allow five (5) days for Departmental Representative's review of each submission.
- .6 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .7 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .8 Accompany submissions with transmittal letter containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .9 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.

- .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
- 
- .10 After Departmental Representative's review, distribute copies.
  - .11 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
  - .12 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
  - .13 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
    - .2 Testing must have been within 3 years of date of contract award for project.
  - .14 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
    - .2 Certificates must be dated after award of project contract complete with project name.
  - .15 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
  - .16 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
  - .17 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with

manufacturer's standards or instructions.

- .18 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .19 Delete information not applicable to project.
- .20 Supplement standard information to provide details applicable to project.
- .21 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's business address.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.
- .1 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for all controlled products and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two [2] copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 CERTIFICATES  
AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

END OF SECTION



PART 1 - GENERAL

1.1 RELATED  
REQUIREMENTS

.1 Not applicable.

1.2 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
- .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990, c.0.1, as amended and O. Reg. 213/91 as amended] - Updated [2005].

1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.  
Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five (5) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within three (3) days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or

safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

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

#### 1 . 4 FILING OF NOTICE

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

#### 1 . 5 SAFETY ASSESSMENT

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

#### 1 . 6 MEETINGS

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

#### 1 . 7 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .3 Utilize local ventilation during application of a controlled product that results in the release of volatile organic compounds to the air.
- .4 Release of controlled product into the sanitary or storm water system of the building is strictly prohibited.

#### 1 . 8 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

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

1 . 9 COMPLIANCE  
REQUIREMENTS

- . 1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.
- . 2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1 . 10 UNFORSEEN  
HAZARDS

- . 1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety Officer and follow procedures in accordance with Acts and Regulations of Ontario having jurisdiction and advise Departmental Representative verbally and in writing.

1 . 11 POSTING OF  
DOCUMENTS

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

1 . 12 CORRECTION OF  
NON-COMPLIANCE

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

1 . 13 BLASTING

- . 1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Departmental Representative.

1.14 POWDER  
ACTUATED DEVICES

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

1.15 WORK STOPPAGE

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED  
REQUIREMENTS

.1 Not applicable.

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

1.15 WORK STOPPAGE

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

END OF SECTION



PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Submittal Procedures 013300
- .2 Closeout Procedures 017700

1.2 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-94, Stipulated Price Contract.

1.3 INSPECTION

- .1 Refer to CCDC 2, GC 2.3.
- .2 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.4 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative. Pay costs for retesting and

reinspection.

1.5 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.6 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples

1.7 REJECTED WORK

- .1 Refer to CCDC, GC 2.4.
- .2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .3 Make good other Contractor's work damaged by such removals or replacements promptly.
- .4 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.8 REPORTS

- .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.10 MILL TESTS

.1 Submit mill test certificates as requested.

1.11 EQUIPMENT AND  
SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical  
and building equipment systems.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not applicable.

1.2 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)  
.1 CCDC 2-94, Stipulated Price Contract.
- .2 Within text of each specifications section, reference may be made to reference standards.
- .3 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .4 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .5 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.3 QUALITY

- .1 Refer to CCDC 2.

1.4 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

- .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 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .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.

#### 1.6 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Departmental Representative. Unload, handle and store such products.

#### 1.7 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

#### 1.8 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.9 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.11 REMEDIAL WORK

- .1 Refer to CCDC 25.

1.12 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

1.13 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.14 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. Use No. 304 stainless steel for exterior areas.
- .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. Use resilient washers with stainless steel.

1.15 PROTECTION OF  
WORK IN PROGRESS

- .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

1.16 EXISTING  
UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS .1 Section 017421.
- 1.2 REFERENCES .1 Canadian Construction Documents Committee (CCDC)  
.1 CCDC 2-2008, Stipulated Price Contract.
- 1.3 PROJECT CLEANLINESS
- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3 Not applicable.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- 1.4 FINAL CLEANING .1 Refer to CCDC 2, GC 3.14.

END OF SECTION



PART 1 - GENERAL

1.2 RELATED  
REQUIREMENTS

.1 Not applicable.

1.3 REFERENCES

- .1 Definitions:
- .1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
  - .2 Class III: non-hazardous waste - construction renovation and demolition waste.
  - .3 Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non-hazardous waste materials generated during construction, demolition, and/or renovation activities
  - .4 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices (Schedule E).
  - .5 Inert Fill: inert waste - exclusively asphalt and concrete.
  - .6 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
  - .7 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
  - .8 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
  - .9 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
  - .10 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
    - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
    - .2 Returning reusable items including pallets or unused products to vendors.
  - .11 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
  - .12 Separate Condition: refers to waste sorted into individual types.
  - .13 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
  - .14 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled.
  - .15 Waste Diversion Report: detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and landfilled over course of project. Measures success against Waste Reduction Workplan (WRW) goals and identifies lessons learned.
  - .16 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.

.17 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.

.2 Reference Standards:

.2 Ontario Ministry of Environment

.1 Ontario 3 R's Regulations (regulation 102/94) for waste management programs applicable to construction and demolition projects greater than 2,000 m<sup>2</sup>.

.2 Ontario Environmental Protection Act (EPA)

.1 Regulation 102/94, Waste Audits and Waste Reduction Workplans.

.2 Regulation 103/94, Source Separation Programs.

.3 Canadian Construction Association (CCA)

.1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.

1.4 DOCUMENTS

.1 Not Applicable.

1.5 ACTION AND  
INFORMATIONAL  
SUBMITTALS

.1 Submit in accordance with Section [01 33 00 - Submittal Procedures].

1.6 WASTE AUDIT  
(WA)

.1 Not Applicable.

1.7 WASTE  
REDUCTION  
WORKPLAN (WRW)

.1 Not Applicable.

1.8 COST/REVENUE  
ANALYSIS  
WORKPLAN  
(CRAW)

.1 Not Applicable.

1.9 WASTE  
SOURCE  
SEPARATION  
PROGRAM (WSSP)

.1 Not Applicable.

1.10 USE OF SITE  
AND FACILITIES

.1 Execute Work with minimal interference and disturbance to normal use of premises.

.2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative.

1.11 WASTE  
PROCESSING  
SITES

.1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

1.12 QUALITY  
ASSURANCE

- .1 Refer to Section 014500

1.13 STORAGE,  
HANDLING AND  
PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal do not become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .9 Separate and store materials produced during project in designated areas.
- .10 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
- .1 On-site source separation is recommended.
  - .2 Remove co-mingled materials to offsite processing facility for separation.
  - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
  - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.14 DISPOSAL OF  
WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, storm, or sanitary sewers.
- .3 Not Applicable.
- .4 Remove materials on-site as Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

1.15 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress

of Work.

### PART 3 - EXECUTION

#### 3.1 APPLICATION

- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

#### 3.2 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 [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.  
.2 Source separate materials to be reused/recycled into specified sort areas.

#### 3.3 DIVERSION OF MATERIALS

- .1 Separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by the Departmental Representative, and consistent with applicable fire regulations.  
.1 Mark containers or stockpile areas.
- .2 On-site sale of salvaged, recovered, reusable, recyclable, materials is not permitted.

#### 3.4 WASTE DIVERSION REPORT

- .1 Not Applicable

#### 3.5 WASTE AUDIT (WA)

- .1 Not Applicable

#### 3.6 WASTE REDUCTION WORKPLAN (WRW)

- .1 Not Applicable.

#### 3.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

- .1 Not Applicable.

#### 3.8 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

- .1 Not Applicable

3.9 SCHEDULES

\_\_\_\_\_ .1 Not Applicable

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS .1 Section 01 33 00 - Submittal Procedures.
- 1.2 REFERENCES .1 Canadian Environmental Protection Act (CEPA) .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.
- 1.3 ADMINISTRATIVE REQUIREMENTS .1 Not applicable.
- 1.4 ACTION AND INFORMATIONAL SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two (2) final copies of operating and maintenance manuals in English.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.
- 1.5 FORMAT .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.  
.1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.  
.1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:100 scaled CAD files in dwg format on CD.

1.6 CONTENTS -  
PROJECT RECORD  
DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
  - .1 Date of submission; names.
  - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
  - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
  - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.7 AS -BUILT  
DOCUMENTS AND  
SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
  - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
  - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.8 RECORDING  
INFORMATION ON  
PROJECT RECORD  
DOCUMENTS

- .1 Record information on set of blue line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
  - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each tem to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.9 FINAL SURVEY

- .1 Not applicable.

1.10 EQUIPMENT AND  
SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
  - .1 Give function, normal operation characteristics and limiting conditions.
  - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal



operating instructions and sequences.

.1 Include regulation, control, stopping, shut-down, and emergency instructions.

.2 Include summer, winter, and any special operating instructions.

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

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

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

.8 Include sequence of operation by controls manufacturer.

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

.10 Provide installed control diagrams by controls manufacturer.

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

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

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

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.

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

#### 1.11 MATERIALS AND FINISHES

.1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

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

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

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

1.12 MAINTENANCE  
MATERIALS

- .1 Spare Parts:
  - .1 Provide spare parts, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Deliver to location as directed; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Departmental Representative.
    - .2 Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock Materials:
  - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Deliver to location as directed; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Departmental Representative.
    - .2 Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
- .3 Special Tools:
  - .1 Provide special tools, in quantities specified in individual specification section.
  - .2 Provide items with tags identifying their associated function and equipment.
  - .3 Deliver to location as directed; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Departmental Representative.
    - .2 Include approved listings in Maintenance Manual.

1.13 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and for review by Departmental Representative.

1.14 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
  - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
  - .4 Verify that documents are in proper form, contain full information, and are notarized.
  - .5 Co-execute submittals when required.
  - .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Include information contained in warranty management plan as follows:
  - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
  - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, alarm systems, sprinkler systems, lightning protection systems,.
  - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
    - .1 Name of item.
    - .2 Model and serial numbers.
    - .3 Location where installed.
    - .4 Name and phone numbers of manufacturers or suppliers.
    - .5 Names, addresses and telephone numbers of sources of spare parts.

- .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
- .7 Cross-reference to warranty certificates as applicable.
- .8 Starting point and duration of warranty period.
- .9 Summary of maintenance procedures required to continue warranty in force.
- .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
- .11 Organization, names and phone numbers of persons to call for warranty service.
- .12 Typical response time and repair time expected for various warranted equipment.
- .4 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.
- .5 Procedure and status of tagging of equipment covered by extended warranties.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .9 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .10 Written verification to follow oral instructions.
  - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.
- 1.15 WARRANTY TAGS
  - .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.
  - .2 Attach tags with copper wire and spray with waterproof silicone coating.
  - .3 Leave date of acceptance until project is accepted for occupancy.
  - .4 Indicate following information on tag:
    - .1 Type of product/material.
    - .2 Model number.
    - .3 Serial number.
    - .4 Contract number.
    - .5 Warranty period.
    - .6 Inspector's signature.
    - .7 Construction Contractor.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- .1 Removal, and off-Site disposal of approximately 70 linear feet and 40 fittings friable asbestos containing pipe insulation using the glove bag method.
- .2 Clean up and off-Site disposal of approximately 2 square feet of friable asbestos containing pipe debris at the base of the floor in three separate locations.
- .3 Removal, and off-Site disposal of approximately 170 square feet of asbestos containing floor tile in room 207.

### 1.2 RELATED DOCUMENTS

- .1 Project Specific Designated Substances Survey Report, Building 49 – Washroom Renovation Project, Central Experimental Farm, Ottawa, ON. Prepared by EHS Partnerships Ltd., November, 2015 , Ref. No.: 04-0004-15-014.

### 1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CSA Standard Z94.4-02, Selection, Use and Care of Respirators.
- .2 Department of Justice Canada
  - .1 Canadian Environmental Protection Act (CEPA), 1999.
- .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 Occupational Health and Safety Act (OHSA)
  - .1 Ontario Regulation 278/05, Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations.
  - .2 Ontario Regulation 213/91, Regulation for Construction Projects.
  - .3 Ontario Regulation 860/90, Workplace Hazardous Materials Information System (WHMIS) Regulation.
  - .4 Ontario Regulation 833/90, Control of Exposure to Biological and Chemical Agents.
- .6 Ontario Ministry of Labour (MOL)
  - .1 A Guide to the Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations, November 2007.

- .7 Ontario Environmental Protection Act (OEPA)
  - .1 Guideline C-6, Handling, Transportation and Disposal of Asbestos Waste in Bulk.
  - .2 Ontario Regulation 347, as amended, Waste Management.

#### 1.4 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 percent or more asbestos by dry weight.
- .3 Asbestos Work Area: area where work takes place which will, or may disturb ACMs.
- .4 Authorized Visitors: designated representative(s), and representative(s) of regulatory agencies.
- .5 Competent worker and/or 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 Provincial, Federal, and local 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 Consultant: EHS Partnerships Ltd, 406-2 Gurdwara Road, Ottawa, ON, K2E 1A2, Phone: 613-828-8989.
- .7 Contractor: Asbestos Abatement Contractor.
- .8 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.
- .9 Glove Bag: prefabricated glove bag as follows:
  - .1 Minimum thickness 0.25 mm (10 mil) 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.
- .10 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.
- .11 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .12 Occupied Area: any area of building or work site that is outside Asbestos Work Area.
- .13 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.

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

### 1.5 SUBMITTALS

Prior to Site mobilization the contractor must submit the following documentation to the Consultants satisfaction:

- .1 Proof that suitable arrangements have been made to dispose of asbestos containing waste in accordance with requirements of authority having jurisdiction.
- .3 Proof of Contractor's Asbestos Liability Insurance.
- .4 Submit proof 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.
- .5 Submit proof that supervisory personnel have attended asbestos abatement supervisory course approved by Consultant. Minimum of one supervisor for every ten workers.
- .6 Submit Worker's Compensation Board status and transcription of insurance.
- .7 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;
  - .4 All additional controlled products.
- .9 Proof that employees have valid respirator training and fit testing. Workers must be fit tested with respirator that is personally issued. Respirator training and fit testing is valid for two years and must be provided by a competent person.

### 1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications the more stringent requirement applies. Comply with regulations in effect at the time work is performed.
- .2 Health and Safety:
  - .1 Safety Requirements: worker and visitor protection.
    - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
      - .1 Respirator 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 respiratory protection program including 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.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Before leaving Asbestos Work Area, the worker must decontaminate their 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.

.4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.

.5 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.6 Visitor Protection:

.1 Provide protective clothing and approved fit-tested respirators to Authorized Visitors to work areas.

.2 Visitors must be trained 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.



1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Place materials defined as hazardous or toxic in designated containers.
- .2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, OEPA, Regional and Municipal regulations. The most stringent requirement shall apply in the case of conflict among waste handling requirements.
- .3 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double-bagged 0.15mm thickness bags or leak proof drums. Label containers with appropriate warning labels.
- .4 Contractor shall submit to Consultant weight scale manifests/manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.
- .5 Bulk asbestos waste may only be transported and disposed of under a waste management system operating under C of A or provisional C of A that specifically authorizes the transportation of asbestos waste in bulk.

1.8 EXISTING  
CONDITIONS

- .1 The report listed in item 1.2 detail existing conditions at the Site and must be reviewed entirely prior to conducting the works detailed in this specification. Contact the Project Manager to acquire a copy of this report for review. Contact the Project Manager to acquire clarification of this document if required prior to bidding the project.
- .2 Contractor shall notify Consultant in writing of designated and hazardous substances discovered during work and not apparent from specifications, or report pertaining to Work. Do not disturb such material until instructed by Consultant in writing.

1.9 SCHEDULING

- .1 Hours of Work: perform work involving asbestos during normal working hours.

1.10 TRAINING

- .1 Before beginning Work, provide Consultant 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: 0.15 mm thick.
  - .2 FR polyethylene: 0.15 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: 0.15 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 Labeling 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 consultant.
  - .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.

.7 Encapsulant: surface film forming type conforming to CAN/CGSB-1.205.

### 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 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in accordance with item O. Reg. 278.
- .2 Before beginning work make arrangements with Consultant to conduct pre-contamination inspection(s) of work area(s). Asbestos abatement operations may only commence when Contractor has received notice from the Consultant to proceed.
- .3 Before beginning work remove visible dust from all surfaces in Asbestos Work Area.
  - .1 Use HEPA vacuum or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
  - .2 Do not use compressed air or dry sweeping 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 asbestos containing materials and walls themselves do not enclose work area erect enclosure of polyethylene sheeting around work area.
  - .3 Seal ventilation ducts to and from the work area.
- .5 Pipe Insulation Removal Using Glove Bag (If Required):
  - .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 Disable mechanical ventilation system serving the Asbestos Work Area and seal all openings or voids.
- .3 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 repaired or replaced, as appropriate. 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.
- .4 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.
- .5 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.
- .6 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.
- .7 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.
- .8 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.
- .9 Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.
  
- .6 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 at the contractor's expense.
  
- .7 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 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.

- .8 Removing non-friable asbestos containing materials by breaking, cutting, drilling, abrading, grounding, sanding or vibrating is allowed if:
- .1 The material is not wetted to control the spread of dust or fibres, and
- .2 The work is done only by means of non-powered hand-held tools.
- .9 Removing non-friable asbestos containing materials by breaking, cutting, drilling, abrading, grounding, sanding or vibrating is allowed if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
- .10 Following asbestos material removal and prior to removing work area control measures make arrangements with the Consultant to conduct post-contamination inspection(s). Work area control measures must remain in place until notification is provided to the contractor stating that work has been completed and control measures may be removed.

### 3.3 AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, Consultant may take air samples at any time.
- .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial Occupational Health and Safety Regulations.
- .2 If air monitoring shows that areas outside Asbestos Work Area(s) are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Area at the contractor's expense.
- .3 Ensure that respiratory safety factors are not exceeded.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 06 20 00 - Finish Carpentry.
- .2 Section 06 40 00 - Architectural Woodworking.
- .3 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

- .1 CSA International
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2 CSA O121-08, Douglas Fir Plywood.
  - .3 CAN/CSA-O141-05, Softwood Lumber.
  - .4 CSA O151-09, Canadian Softwood Plywood.
  - .5 CAN/CSA-O325.0-07, Construction Sheathing.
- .2 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
  - .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1.
  - .3 FSC Accredited Certified Bodies.
- .3 Green Seal Environmental Standards (GS)
  - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .4 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber [2000].

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for rough carpentry work and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 MAINTENANCE MATERIALS SUBMITTALS

- .1 Extra Stock Materials:
  - .1 Provide electrical equipment backboards for mounting electrical equipment as indicated. Use 19 mm thick plywood on 19 x 38 mm furring around spacing, perimeter and at maximum 300 mm intermediate

1.5 QUALITY ASSURANCE

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: by grade mark in accordance with applicable CSA standards.
- .3 Plywood, OSB and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA standards.

- .4 Sustainable Standards Certification:
  - .1 Certified Wood: submit listing of wood products and materials used in accordance with FSC-STD-01-001.

#### 1.6 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
  - .1 CAN/CSA-O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Furring, blocking, nailing strips, grounds, rough bucks, and fascia backing:
  - .1 Board sizes: "Standard" or better grade.
  - .2 Dimension sizes: "Standard" light framing or better grade.
  - .3 Post and timbers sizes: "Standard" or better grade.
- .3 Panel Materials:
  - .1 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .4 Primers, Paints, Coatings: in accordance with manufacturer's recommendations for surface conditions:
  - .1 Primer: VOC limit 100 g/L maximum to GS-11 SCAQMD Rule 1113.
  - .2 Paint: VOC limit 150 g/L maximum to GS-11 SCAQMD Rule 1113.
  - .3 Coating: VOC limit 275 g/L maximum to GS-11 SCAQMD Rule 1113.

#### 2.2 ACCESSORIES

- .1 Nails, spikes and staples: to CSA B111.
- .2 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for rough carpentry installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .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 INSTALLATION

- .1 Comply with requirements of NBC, supplemented by the following paragraphs.
- .2 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding and other work as required.
- .3 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .4 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .5 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.
- .6 Use caution when working with particle board. Use dust collectors and high quality respirator masks.
- .7 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .8 Countersink bolts where necessary to provide clearance for other work.

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 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.

END OF SECTION



PART 1 - GENERAL

1.1 RELATED  
REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 06 40 00 - Architectural Woodwork.
- .3 Section 06 47 00 - Plastic Laminate Finishing.
- .4 Section 08 71 73 - Special Function Hardware.
- .5 Section 09 91 23 - Interior Painting.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A208.1-09, Particleboard.
  - .2 ANSI A208.2-09, Medium Density Fibreboard (MDF) for Interior Applications.
  - .3 ANSI/HPVA HP-1-2004, American National Standard for Hardwood and Decorative Plywood.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1 Architectural Woodwork Quality Standards, 1st edition, 2009.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-11.3-M87, Hardboard.
- .4 CSA International
  - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
  - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CSA O141-05, Softwood Lumber.
  - .5 CSA O151-09, Canadian Softwood Plywood.
  - .6 CSA O153-M1980(R2008), Poplar Plywood.
- .5 National Lumber Grades Authority (NLGA)
  - .1 NLGA Standard Grading Rules for Canadian Lumber 2008.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS

- .1 Shop Drawings:
  - .1 Submit drawings in accordance with Section 01 33 00 - Submittal Procedure.
  - .2 Indicate details of construction, profiles, jointing, fastening and other related details.
  - .3 Indicate materials, thicknesses, finishes and hardware.

- .2 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 for review and acceptance of each unit.
  - .2 Submit duplicate 300 x 300 mm, unless otherwise specified.
- .1 Lumber by grade stamp of agency certified by Canadian Lumber Standards Accreditation Board (CLSAB).

1.4 QUALITY  
ASSURANCE

1.5 DELIVERY,  
STORAGE AND  
HANDLING

- .2 Plywood, particleboard, OSB and wood based composite panels to CSA and ANSI standards.
- .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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood products from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

1.6 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and Waste Reduction Workplan, and Waste Management plan to maximum extent economically possible.
- .2 Set aside damaged wood for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger-joining, or ties). Store separated reusable wood waste convenient to cutting station and area of work.
- .3 Separate corrugated cardboard in accordance with Waste Management Plan and place in designated areas for recycling.
- .4 Do not burn scrap at project site.
- .5 Fold up metal banding, flatten, and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Softwood lumber: unless otherwise specified, S4S, moisture content 19% or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
  - .3 AWMAC custom premium grade, moisture content as specified.
- .2 Machine stress-rated lumber is acceptable.
- .3 Hardwood lumber: moisture content in accordance with the following standards:
  - .1 National Hardwood Lumber Association (NHLA).
  - .2 AWMAC custom premium grade, moisture content as specified.

- .4 Panel Material: Urea-formaldehyde free
  - .1 Douglas fir plywood (DFP): to CSA O121, standard construction.
  - .2 Canadian softwood plywood (CSP): to CSA O151, standard construction.
  - .3 Hardwood plywood: to ANSI/HPVA HP-1.
  - .4 Poplar plywood (PP): to CSA O153, standard construction.
  - .5 Hardboard: to CAN/CGSB-11.3.
  - .6 Medium density fibreboard (MDF): to ANSI A208.2, density 640-800 kg/m<sup>3</sup>.
    - .1 Medium density fibre board must:
      - .1 be manufactured such that formaldehyde emissions do not exceed 0.30ppm when tested in accordance with ASTM E 133.
  - .7 Low density fibreboard: to CSA-A247M.

## 2.2 ACCESSORIES

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber; plain, copper, and stainless steel finish elsewhere.
- .2 Wood screws: type and size to suit application.
- .3 Splines: wood.
- .4 Adhesive and Sealants: in accordance with manufacturer's instructions.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- .1 Do finish carpentry to Quality Standards of (AWMAC) except where otherwise specified.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- .3 Form joints to conceal shrinkage.

### 3.2 CONSTRUCTION

- .1 Fastening:
  - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
  - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
  - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
  - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .2 Interior and exterior frames:
  - .1 Set frames with plumb sides, level heads, sills, and secure.
- .3 Shelving:
  - .1 Install shelving on ledgers.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED  
REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 07 92 00 - Joint Sealants.
- .3 Section 08 71 73 - Special Function Hardware.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
  - .1 ANSI/NPA A208.1-09, Particleboard.
  - .2 ANSI/NPA A208.2-09, Medium Density Fiberboard (MDF) for Interior Applications.
  - .3 ANSI/HPVA HP-1-04, Standard for Hardwood and Decorative Plywood.
- .2 ASTM International
  - .1 ASTM E 1333-96(2002), Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
  - .2 ASTM D 2832-92(R2005), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .3 ASTM D 5116-06, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 (2009).
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .5 CSA International
  - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
  - .2 CSA O112.4 SERIES-M1977(R2006), Standards for Wood Adhesives.
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CSA O141-05, Softwood Lumber.
  - .5 CSA O151-09, Canadian Softwood Plywood.
  - .6 CSA O153-M1980(R2008), Poplar Plywood.
- .6 International Organization for Standardization (ISO)
  - .1 ISO 14040-2006, Environmental Management-Life Cycle Assessment - Principles and Framework.
  - .2 ISO 14041-98, Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.
- .7 National Electrical Manufacturers Association (NEMA)
  - .1 ANSI/NEMA LD-3-05, High-Pressure Decorative Laminates (HPDL).

1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS

- .8 National Hardwood Lumber Association (NHLA)
  - .1 Rules for the Measurement and Inspection of Hardwood and Cypress 1998.
- .9 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2003(R2007).

- .1 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.
    - .1 Scales: profiles full size, details half full size.
  - .3 Indicate materials, thicknesses, finishes and hardware.
  - .4 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

- .2 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate samples of laminated plastic joints, edging, cutouts and postformed profiles.

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 and Waste Reduction Workplan, and Waste Management plan to maximum extent economically possible.
- .2 Set aside damaged wood for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger-jointing, or ties). Store separated reusable wood waste convenient to cutting station and area of work.
- .3 Separate corrugated cardboard in accordance with Waste Management Plan and place in designated areas for recycling.
- .4 Do not burn scrap at project site.
- .5 Fold up metal banding, flatten, and place in designated area of recycling.

1.5 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .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.
- .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 Store and protect architectural woodwork from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 15% or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
  - .3 AWMAC custom premium grade, moisture content as specified.
- .2 Machine stress-rated lumber is acceptable for all purposes.
- .3 Ensure manufacturing process adheres to Lifecycle Assessment (LCA) Standards to ISO 14040/14041 LCA Standards, CSA Z760 94 Life Cycle Assessment.
- .4 Hardwood lumber: moisture content in accordance with following standards:
  - .1 National Hardwood Lumber Association (NHLA).
  - .2 AWMAC custom premium grade, moisture content as specified.
- .5 Douglas fir plywood (DFP): to CSA O121, standard construction, FSC certified.
  - .1 Plywood resin to contain no added urea-formaldehyde.
- .6 Canadian softwood plywood (CSP): to CSA O151, standard construction, FSC certified.
- .7 Hardwood plywood: to ANSI/HPVA HP-1, FSC certified.
- .8 Poplar plywood (PP): to CSA O153, standard construction, FSC certified.
- .9 Interior mat-formed wood particleboard: to ANSI/NPA A208.1, FSC certified.
- .10 Birch plywood: to AWMAC Select White.
- .11 Fibreboard must contain less than 10% roundwood by weight, using weighted average over three month period at manufacturing locations.
- .12 Hardboard:
  - .1 To CAN/CGSB-11.3, FSC certified.
  - .2 Hardboard resin to contain no added urea-formaldehyde.
- .13 MDF (medium density fibreboard) core: to ANSI/NPA A208.2, Grade 19 mm thick, density 769 kg/m<sup>2</sup>, FSC certified.

- .1 Medium density fibreboard performance requirements to:  
ANSI/NPA A208.2.
- .2 MDF resin to contain no added urea-formaldehyde.
- .14 Laminated plastic: per Section 06 47 00 - Plastic Laminate.
- .15 Thermofused Melamine: to NEMA LD3 Grade VGL.
  - .1 High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).
- .16 Nails and staples: to CSA B111.
- .17 Wood screws: type and size to suit application.
- .18 Splines: wood.
- .19 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .20 Laminated plastic adhesive as recommended by plastic laminate manufacturer:
  - .1 Adhesive: VOC limit 30 g/L maximum to SCAQMD Rule 1168.
  - .2 Acceptable materials: ECP\_UU.
- 2.2 MANUFACTURED UNITS
  - .1 Casework:
    - .1 Fabricate caseworks to AWMAC premium quality grade.
    - .2 Furring, blocking, nailing strips, grounds and rough bucks and sleepers.
      - .1 S2S is acceptable.
      - .2 Board sizes: "standard" or better grade.
      - .3 Dimension sizes: "standard" light
    - .3 Case bodies (ends, divisions and bottoms).
      - .1 Hardwood plywood:
        - .1 Thickness: as indicated on drawings.
        - .2 Number of plies: 3.
        - .3 Face veneer: plastic laminate.
        - .4 Interior veneer: melamine to match face.
        - .5 Core: medium density.
        - .6 Bond: Type II.
        - .7 Sanding: refer to plastic laminate manufacturer's instructions.
        - .8 Grain direction vertical.
      - .2 Side and Backs:
        - .1 Fabricate to AWMAC premium grade match case bodies.
  - .2 Drawers:
    - .1 Fabricate drawers to AWMAC custom grade supplemented as follows:
    - .2 Sides and Backs.
      - .1 Hardwood plywood:
        - .1 Thickness: as indicated on drawings.
        - .2 Number of plies: 3.
        - .3 Face veneer : plastic laminate.
        - .4 Back veneer: to match face.

- .5 Core: medium density.
- .6 Bond: Type II.
- .7 Sanding: refer to manufacturer's instructions.
- .8 Grain direction: vertical.

### 2.3 FABRICATION

- .1 Set nails and countersink screws apply wood filler to indentations, sand smooth and leave ready to receive finish.
- .2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .3 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .7 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .8 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to [2400] [3000] mm. Keep joints 600 mm from sink cutouts.
- .9 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .10 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .11 Apply laminate backing sheet to reverse side of core of plastic laminate work.

### 2.4 FINISHING

- .1 Finish in accordance with Section 09 91 23 - Interior Painting.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- .1 Do architectural woodwork to Quality Standards of AWMAC.
- .2 Install prefinished millwork at locations shown on drawings.
  - .1 Position accurately, level, plumb straight.
- .3 Fasten and anchor millwork securely.
  - .1 Supply and install 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 back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.
- .7 Fit hardware accurately and securely in accordance with manufacturer's written instructions.
- .8 Install hardware per drawings - Section 08 70 05 - Cabinet and Miscellaneous Hardware.
- .9 Site apply laminated plastic to units as indicated.
  - .1 Adhere laminated plastic over entire surface.
  - .2 Make corners with hairline joints.
  - .3 Use full sized laminate sheets.
  - .4 Slightly bevel arises. Use full sized laminate sheets.
  - .5 Make joints only where approved.
- .10 For site application, offset joints in plastic laminate facing from joints in core.

### 3.2 CLEANING

- .1 Progress 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.
  - .1 Clean millwork and cabinet work inside cupboards and drawers and outside surfaces.
  - .2 Remove excess glue from surfaces.

### 3.3 PROTECTION

- .1 Protect millwork and cabinet work from damage until final inspection.
- .2 Protect installed products and components from damage during construction.
- .3 Repair damage to adjacent materials caused by architectural woodwork installation.

### 3.4 SCHEDULES

- .1 Refer to Architectural and Interior Design drawings.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 06 20 00 - Finish Carpentry.
- .3 Section 06 40 00 - Architectural Woodwork.

### 1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
  - .1 ANSI 208.1-99, Particleboard.
  - .2 ANSI A208.2-02, medium density fibre board (MDF) for interior applications.
- .2 ASTM International
  - .1 ASTM D 2832-92(R1999), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .2 ASTM D 2369-07, Standard Test Method for Volatile Content of Coatings.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .4 CSA International
  - .1 CSA O112-SERIES M1977(R2006), Standards for Wood Adhesives.
  - .2 CSA O121-08, Douglas Fir Plywood.
  - .3 CSA O151-09, Canadian Softwood Plywood.
  - .4 CSA O153-M1980(R2008), Poplar Plywood.
- .5 Environmental Choice Program (ECP)
  - .1 CCD-045-95, Sealants and Caulking Compounds.
  - .2 CCD-046-95, Adhesives.

### 1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit manufacturer's instructions, printed product literature and data sheets in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements. Indicate VOC's for adhesives, solvents and cleaners.
- .4 Samples:
  - .1 Submit duplicate samples for review in accordance with Section 01 33 00 - Submittal Procedures and acceptance of each unit.

### 1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal and Waste Reduction Work plan, and Waste Management plan to maximum extent economically possible.
- .2 Separate corrugated cardboard in accordance with Waste Management Plan and place in designated areas for recycling.

- .3 Do not burn scrap at project site.
- .4 Fold up metal banding, flatten, and place in designated area for recycling.

#### 1.5 CLOSEOUT SUBMITTALS

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect all materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- .1 Plastic laminate:
  - .1 Refer to Architectural and Interior Design drawings for exact types. Contact Departmental Representative immediately if laminate type is discontinued.
    - .1 L1 – (Black).
- .2 Laminated plastic for flatwork: to ANSI/NEMA LD3.
  - .1 Type: General purpose.
  - .2 Grade: HGS.
  - .3 Size: note less than 1.1 mm thick.
  - .4 Colour: patterned.
  - .5 Pattern: printed pattern.
  - .6 Finish: matt and textured.
- .3 Laminated plastic for backing sheet: to ANSI/NEMA LD3.
  - .1 Type: backer.
  - .2 Grade: BKH.
  - .3 Size: not less then 0.5 mm thick.
  - .4 Colour: same colour as face laminate.
- .4 Laminated plastic for liner: to ANSI/NEMA LD3.
  - .1 Type: cabinet liner.
  - .2 Grade: CLS.
  - .3 Size: 10-13 mm thick
  - .4 Colour: white.
  - .5 Plywood core: to CSA-0121, CSA 0151, and CSA 0153 solid two sides, 16 mm thick.
  - .6 Laminated plastic adhesive: per manufacturer's written instructions/recommendations.
    - .1 Test for acceptable VOC emissions in accordance with ASTM D 2369 and ASTM D 2832.
    - .2 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.
  - .5 Test for acceptable VOC emissions to ASTM D 2369 and ASTM D 2832.
    - .1 Sealants:
      - .1 Test for acceptable VOC emissions to ASTM D 2369 and

ASTM D 2832.

- .2 VOC limit: 5% by weight maximum to CCD-045.
- .3 Draw bolts and splines: as recommended by fabricator.

## 2.2 FABRICATION

- .1 Casework:
  - .1 Fabricate caseworks to AWMAC premium quality grade.
  - .2 Furring, blocking, nailing strips, grounds and rough bucks and sleepers.
    - .1 S2S is acceptable.
    - .2 Board sizes: "standard" or better grade.
    - .3 Dimension sizes: "standard" light
  - .3 Case bodies (ends, divisions and bottoms).
    - .1 Hardwood plywood:
      - .1 Thickness: as indicated on drawings.
      - .2 Number of plies: 3.
      - .3 Face veneer: plastic laminate.
      - .4 Interior veneer: melamine to match face.
      - .5 Core: medium density.
      - .6 Bond: Type II.
      - .7 Sanding: refer to plastic laminate manufacturer's instructions.
      - .8 Grain direction vertical.
    - .2 Side and Backs:
      - .1 Fabricate to AWMAC premium grade match case bodies.
- .2 Drawers:
  - .1 Fabricate drawers to AWMAC custom grade supplemented as follows:
  - .2 Sides and Backs.
    - .1 Hardwood plywood:
      - .1 Thickness: as indicated on drawings.
      - .2 Number of plies: 3.
      - .3 Face veneer : plastic laminate.
      - .4 Back veneer: to match face.
      - .5 Core: medium density.
      - .6 Bond: Type II.
      - .7 Sanding: refer to manufacturer's instructions.
      - .8 Grain direction: vertical.

## 2.3 FABRICATION

- .1 Comply with ANSI/NEMA LD3, Annex A.
- .2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .3 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .4 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Keep joints 600 mm from sink cutouts.
- .5 Use straight self-edging laminate strip for flatwork to cover exposed

- edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .6 Apply laminate backing sheet to reverse side of core of plastic laminate work.
  - .7 Apply laminated plastic liner sheet to interior of cabinetry.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for laminate, adhesive, and core materials installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .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 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

#### 3.3 INSTALLATION

- .1 Install work plumb, true and square, neatly scribed to adjoining surfaces.
- .2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.
- .3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm on centre, 75 mm from edge. Make flush hairline joints.
- .4 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.
- .5 At junction of laminated plastic counter back splash and adjacent wall finish, apply small bead of sealant. Back splash to only be installed where indicated

#### 3.4 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.
  - .1 Clean to ANSI/NEMA LD3, Annex B.
  - .2 Remove traces of primer, caulking, epoxy and filler materials and clean doors and frames.

#### 3.5 PROTECTION

- .1 Cover finished laminated plastic veneered surfaces with heavy kraft paper or put in cartons during shipment.

- .2 Protect installed laminated surfaces in accordance with manufacturer's written recommendations.
  - .1 Remove protection only immediately before final inspection.
- .3 Protect installed products and components from damage during construction.
- .4 Repair damage to adjacent materials caused by laminate, adhesive, and core materials.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 09 21 16 - Gypsum Bond Assemblies.
- .4 Section 09 51 13 - Acoustical Ceilings.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C 208-[95(2001)], Specification for Cellulosic Fiber Insulating Board.
  - .2 ASTM C 591-[01], Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
  - .3 ASTM C 728-[05], Standard Specification for Perlite Thermal Insulation Board.
  - .4 ASTM C 1126-[04], Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
  - .5 ASTM C 1289-[05a], Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .2 Canadian Gas Association (CGA)
  - .1 CAN/CGA-B149.1-[05], Natural Gas and Propane Installation Code Handbook.
  - .2 CAN/CGA-B149.2-[05], Propane Storage and Handling Code.
- .3 Canadian General Standards Board (CGSB)
  - .1 CGSB 71-GP-24M-[77(R1983)], Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .4 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-[05], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
  - .2 CAN/ULC-S702-[97], Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  - .3 CAN/ULC-S704-[03], Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section [01 33 00 - Submittal Procedures].
  - .2 Submit [two] copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section [01 33 00 - Submittal Procedures]. Indicate VOC's insulation products and adhesives.

-

1.4 QUALITY ASSURANCE

- .2 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.
- .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.
  - .3 Convene pre-installation meeting [one] week prior to beginning [work of this Section] [and] [on-site installations] in accordance with [Section [01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM)]] [Section [01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart]].
    - .1 Verify project requirements.
    - .2 Review installation [and substrate] conditions.
    - .3 Co-ordinate with other building subtrades.
    - .4 Review [manufacturer's] installation instructions and warranty requirements.
  - .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section [01 35 29.06 - 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 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site] for recycling in accordance with Waste Management Plan.

PART 2 - PRODUCTS

2.1 INSULATION

- .1 Sound attenuated rigid insulation: to CAN/ULC-S701.
  - 1. Type: Unfaced glass fiber acoustical insulation complying with ASTM C 665, Type I.
  - 2. Size:  
Thickness 64mm to 152mm Width 609mm Length 2438mm
  - 3. Surface Burning Characteristics:
    - 1. Maximum flame spread: 10
    - 2. Maximum smoke developed: 10When tested in accordance with ASTM E 84.
  - 4. Combustion Characteristics:  
Passes ASTM E 136.
  - 5. Fire Resistance Ratings:  
Passes ASTM E 119 as part of a complete fire tested wall assembly.

2.2 ADHESIVE

- .1 Adhesive (for polystyrene): to CGSB 71-GP-24.
  - .1 VOC emission: low or zero.



2.3 ACCESSORIES

- .1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 WORKMANSHIP

- .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
- .4 Keep insulation minimum [75] mm from heat emitting devices such as recessed light fixtures, and minimum [50] mm from [sidewalls of CAN4-S604 type A chimneys] [and] [CAN/CGA-B149.1 and CAN/CGA-B149.2 [type B] [and] [L] vents].
- .5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .6 Offset both vertical and horizontal joints in multiple layer applications.
- .7 Do not enclose insulation until it has been inspected and approved by Interior Design Consultant.

3.3 EXAMINATION

- .1 Examine substrates and immediately inform Interior Design Consultant in writing of defects.
- .2 Prior to commencement of work ensure:
  - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 RIGID  
INSULATION  
INSTALATION

- .1 Apply adhesive to [polystyrene] [urethane] [mineral fibre] [insulation board] in accordance with manufacturer's recommendations.
- .2 Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive.
- .3 [In addition to adhesive,] install mineral fibre insulation boards with insulation clips and disk, [2] per 600 x 1200 mm board minimum, fit boards tight, cut off fastener spindle 3 mm beyond disk.
- .4 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous [150] mm wide [0.15] mm modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation.

3.5 CLEANING

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

END OF SECTION

## PART 1 - GENERAL

### 1.1 References

- .1 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S101, 1989.
  - .2 CAN/ULC-S102, 1988.

### 1.2 Test Reports

- .1 Submit product data including certified copies of test reports verifying fireproofing applied to substrate as constructed on project will meet or exceed requirements of Specification.
- .2 Submit test results in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.
- .3 For assemblies not tested and rated, submit proposals based on related designs using accepted fireproofing design criteria.

### 1.3 Samples

- .1 N/A.

### 1.4 Mock-up

- .1 Erect mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Apply fireproofing to approximately 10 m<sup>2</sup> area of surface to be treated.
- .3 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with fireproofing work.

### 1.5 Protection

- .1 At outdoor temperatures less than 5°C, ensure that a 5°C air and substrate temperature is maintained during and for 24 hours after application. Ensure that natural ventilation to properly dry the fireproofing during and subsequent to its application is provided. In enclosed areas lacking openings for natural ventilation, ensure that interior air is circulated and exhausted to the outside.
- .2 Provide temporary enclosures to prevent spray from contaminating air beyond application area.
- .3 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of fireproofing materials.

## PART 2 - PRODUCTS

### 2.1 Materials

- .1 Sprayed fireproofing: ULC certified cementitious or asbestos-free mineral fibre fireproofing qualified for use in ULC Designs specified.

- .2 Curing compound: type recommended by fireproofing manufacturer, qualified for use in ULC Designs specified.
- .3 Sealer: type recommended by fireproofing manufacturer, qualified for use in ULC Design specified.

### PART 3 - EXECUTION

#### 3.1 Preparation

- .1 Substrate shall be free of material, which would impair bond.
- .2 Verify that painted substrate(s) are compatible and have suitable bonding characteristics to receive fireproofing.
- .3 Remove incompatible materials.
- .4 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.
- .5 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed.

#### 3.2 Application

- .1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.
- .2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide following fire resistance ratings.

<u>Location</u>	<u>Rating</u>	<u>ULC Design No.</u>
Steel beams	Two Hours	[F906]
	.3	Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.
	.4	Apply fireproofing directly to open web joists without use of expanded lath.
	.5	Tamp smooth, surfaces visible in finished work.
	.6	Apply curing compound to surface of cementitious fireproofing as required by manufacturer.
	.7	Apply sealer to surface of mineral fibre fireproofing as required by manufacturer in ventilation plenums and as indicated.

#### 3.3 Inspection and

- .1 Inspection and testing of fireproofing will be carried out by Testing

Site Tests

Laboratory.

3.4 Patching

.1

Patch damage to fireproofing caused by testing or by other trades before fireproofing is concealed, or if exposed, before final inspection.

END OF SECTION

## PART 1 - GENERAL

- 1.1 Related Work
- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections and all documents referenced herein apply to this Section.
  - .2 Fire stopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Division 15 and 16 respectively.
- 1.2 References
- .1 Underwriter's Laboratories of Canada (ULC)
    - .1 ULC-S115-1995, Fire Tests of Firestop Systems.
    - .2 AD Firebarrier Systems, Canadian Edition.
- 1.3 Samples
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit duplicate 300 x 300 mm samples showing actual firestop material proposed for project.
- 1.4 Shop Drawings
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.
- 1.5 Product Data
- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.
- 1.6 Waste Management and Disposal
- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
  - .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

## PART 2 - PRODUCTS

### 2.1 Manufacturers

- .1 Subject to compliance with the specification requirements, fire stopping and smoke seal systems by the following manufacturers are acceptable:
  - .1 3M Canada, (800) 364-3577
  - .2 A/D Fire Protection Systems Inc., (800) 263-4087
  - .3 Tremco Ltd., (800) 363-3213.
- .2 Acceptance of products by other manufacturer's is subject to the approval of the Departmental Representative. For substitution procedures and criteria, refer to Division 01.

## 2.2 Materials

- .1 Fire stopping and smoke seal systems: in accordance with ULC-S115.
  - .1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended and conforming to special requirements specified in 3.5.
    - .2 Firestop system rating: 2-hours for slab penetrations and 1-hour for penetrations to separations between office and lobbies.
  - .2 2-hour fire stopping between suspended concrete slabs and exterior curtain wall cladding around perimeter of building in accordance with ULC-S115 and listed in ULC Guide No.40 U19, and AD Firebarrier system no. FW-D-1019.
  - .3 Service penetration assemblies: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.
  - .4 Service penetration firestop components: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.13 and ULC Guide No.40 U19.15 under the Label Service of ULC.
  - .5 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
  - .6 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal, included in the work of Division 16.
  - .7 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal, included in the work of Division 15.
  - .8 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
  - .9 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
  - .10 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.

- .11 Sealants for vertical joints: non-sagging.

### PART 3 - EXECUTION

#### 3.1 Preparation

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. 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.

#### 3.2 Installation

- .1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
- .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 a neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

#### 3.3 Inspection

- .1 Notify Departmental Representative when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

#### 3.4 Schedule

- .1 Firestop and smoke seal at:
  - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
  - .2 Top of fire-resistance rated masonry and gypsum board partitions.
  - .3 Intersection of fire-resistance rated masonry and gypsum board partitions.
  - .4 Control and sway joints in fire-resistance rated masonry and



gypsum board partitions and walls.

- .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .6 Openings and sleeves installed for future use through fire separations.
- .7 2-hour fire stopping between suspended 2-hour concrete slabs and exterior curtain wall cladding.
- .8 Rigid ducts: greater than 129 cm<sup>2</sup>: 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.

### 3.5 Clean Up

- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
- .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.
- .3 As work progresses remove excess materials and clean adjacent surfaces immediately after application.
- .4 Remove temporary dams after initial set of fire stopping and smoke seal materials.
- .5 Upon completion of the work of this Section:
  - .1 Remove masking and temporary protection from adjacent surfaces.
  - .2 Remove stains on adjacent surfaces and make good damage to adjacent surfaces caused by the work of this Section.
  - .3 Remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
  - .4 Remove temporary dams after initial set of fire stopping and smoke.

END OF SECTION

PART 1 - GENERAL

.1 Materials, preparation and application for caulking and sealants.

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 06 90 00 - Architectural woodwork.
- .3 Section 06 20 00 - Finish Carpentry.
- .4 Section 08 11 00 - Metal Doors and Frames.
- .5 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C 919-02, 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.
- .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).

1.3 ACTION AND INFORMATIONAL 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.

1.4 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.

1.5 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 Collect and separate for disposal paper, plastic, polystyrene, and 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 Landlord/Property Manager.

.8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

1.6 SITE CONDITIONS

- .9 Fold up metal banding, flatten, and place in designated area for recycling.
- .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.

1.7 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 Landlord/Property Manager.

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 Silicones One Part.
  - .1 To CAN/CGSB-19.13.
  - .2 Mildew resistant.
- .2 Acoustical Sealant.
  - .1 To ASTM C 919.

JOINT SEALANTS

2.3 SEALANT  
SELECTION

- .3 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 %.
- .1 Perimeters of interior frames, as detailed and itemized: Sealant type: acrylic latex.
- .2 Perimeter of fixtures (e.g. sinks, urinals, stools, waterclosets, basins, vanities): Sealant type: white silicone.
- .3 Exposed interior control joints in drywall, head, base, door frames, and all penetrations in gypsum board partition: Sealant type: acoustic sealant.

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.

3.4 BACK UP MATERIAL

- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
  - .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 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.
- .2 Curing.
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.
- .3 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 and ensure smooth continuous clean bonding joint.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Section 01 61 00 - Common Product Requirements.
- .3 Section 01 78 00 - Closeout Submittals.
- .4 Section 08 14 16 - Flush Wood Doors.
- .5 Section 08 70 05 - Special Function Hardware.
- .6 Division 16: Electrical wiring for magnetic strikes, electric releases and electric locks.

### 1.2 REFERENCES

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
  - .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-69.17-M86(R1993), Bored and Preassembled Locks and Latches.
  - .2 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981, Butts and Hinges.
  - .3 CAN/CGSB-69.19-93/ANSI/BHMA A156.3-1984, Exit Devices.
  - .4 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986, Door Controls (Closers).
  - .5 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.
  - .6 CAN/CGSB-69.22-M90/ANSI/BHMA A156.6-1986, Architectural Door Trim.
  - .7 CAN/CGSB-69.24-M90/ANSI/BHMA A156.8-1982, Door Controls - Overhead Holders.
  - .8 CAN/CGSB-69.26-96/ANSI/BHMA A156.10-1991, Power-operated Pedestrian Doors.
  - .9 CAN/CGSB-69.28-M90/ANSI/BHMA A156.12-1986, Interconnected Locks and Latches.
  - .10 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-1987, Mortise Locks and Latches.
  - .11 CAN/CGSB-69.30-93/ANSI/BHMA A156.14-1991, Sliding and Folding Door Hardware.
  - .12 CAN/CGSB-69.31-M89/ANSI/BHMA A156.15-1981, Closer/Holder Release Device.

- .13 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxiliary Hardware.
- .14 CAN/CGSB-69.33-M90/ANSI/BHMA A156.17-1987, Self-closing Hinges and Pivots.
- .15 CAN/CGSB-69.34-93/ANSI/BHMA A156.18-1987, Materials and Finishes.
- .16 CAN/CGSB-69.35-M89/ANSI/BHMA A156.19-1984, Power Assist and Low Energy Power Operated Doors.
- .17 CAN/CGSB-69.36-M90/ANSI/BHMA A156.20-1984, Strap and Tee Hinges and Hasps.

### 1.3 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
  - .3 After approval samples will be returned for incorporation in the Work.
- .3 Hardware List:
  - .1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.
- .5 Closeout Submittals
  - .1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

### 1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
  - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and



criteria and physical requirements.

1.5 DELIVERY,  
STORAGE, AND  
HANDLING

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .2 Storage and Protection:
  - .1 Store finishing hardware in locked, clean and dry area.

1.6 WASTE DISPOSAL  
AND MANAGEMENT

- .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 Dispose of corrugated cardboard polystyrene plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.7 MAINTENANCE

- .1 Extra Materials:
  - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

PART 2 - PRODUCTS

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

- .1 Locks and latches:
  - .1 Bored and preassembled locks and latches: to CAN/CGSB-69.17, series 2000 preassembled lock, grade 1 series 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
  - .2 Interconnected locks and latches: to CAN/CGSB-69.28, series 5000 interconnected lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
  - .3 Mortise locks and latches: to CAN/CGSB-69.29, series 1000 mortise lock, grade 1, designed for function and keyed as stated in

Hardware Schedule.

- .4 Lever handles: Round tubular design complete with return to the door.
  - .5 Rectangular back plates.
  - .6 Normal strikes: box type, lip projection not beyond jamb.
  - .7 Cylinders: to be provided with Schlage mortise cylinders keyed into the existing keying system as directed by Departmental Representative.
  - .8 Finish: Solid Brass
- .2 Butts and hinges:
- .1 Butts and hinges: to CAN/CGSB-69.18, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
- .3 Exit devices: to CAN/CGSB-69.19, grade 1, modern flat touch bar design, finished to.
- .1 Type and function to be specified in Hardware schedule.
  - .2 Lever design on trim to match exact lever design on mortised locks specified in paragraph 2.2.1
  - .3 Provide fire rated devices for all fire rated doors requiring exit devices.
  - .4 Finish solid brass.
- .5 Door Operators:
- .1 Power-operated pedestrian doors: to CAN/CGSB-69.26.
  - .2 Power assist and low energy power operated doors: to CAN/CGSB-69.35.
- Control boxes: complete with electric strike relay.
- .3 Mount operators on either pull sides of doors as required to place them inside room.
  - .4 Electrical box and actuator: Hardwired low voltage actuator with stainless steel 150 mm round plate, engraved blue filled with handicap symbol. Box 51 mm wide x 102 mm high x 50 mm deep single gang electrical box, flush mounted in wall, locations indicated.
  - .5 Acceptable Product:
    - .1 Power Operator: LCN 9540 Series
    - .2 Push Exit Switches: Express, CM-60/2
- .6 Floor mounted Door Stop: As noted on hardware schedule.
- .7 Door bottom seal: heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene acoustic seal, surface mounted, closed ends, adjustable, automatic retract mechanism when door is open, clear anodized finish.
- .8 Thresholds: full width of door opening

2.4 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with material through which they pass.

### 2.5 KEYING

- .1 Door keying on all doors to be supplied by Departmental representative. Refer to door and hardware schedule.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' instructions for proper installation of each hardware component.

### 3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
- .2 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Install key control cabinet.
- .4 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

3.3 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 SCHEDULE

- .1 Refer to hardware schedule (listed separately).
- .2 List of door hardware being installed by Industry Canada's Contractor (Acme Future Security) under the General Contractor:
  - .1 Schlage lockset D80 PD RHO 626 (store room function lockset) is used on all doors identifies as having a card reader – refer to hardware schedule.
  - .2 Schlage lockset D53 PD R HO 626 (office function lockset) is used on all rooms identified as enclosed offices or meeting/ boardrooms – refer to hardware schedule on drawings.
  - .3 Schlage passage set D10S RHO 626 (passage set) is used on all closet doors and passage doors – refer to hardware schedule.
  4. Door closer: LCN 4040 Series – refer to hardware schedule.
  5. Strike model 611 3.3 FSE DS is to be used where all lever locksets occur – refer to hardware schedule on drawings.
  6. Strike model 611 3.3 FSE DS is to be used where panic sets with card readers are required – refer to hardware schedule on drawings.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures.
- .3 Section 06 20 00 – Finish Carpentry.
- .4 Section 06 40 00 – Architectural Woodwork.
- .5 Section 08 71 00 – Door Hardware - General.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-69.25-M90/ANSI/BHMA A156.9-1982, Cabinet Hardware.
  - .2 CAN/CGSB-69.25-93/ANSI/BHMA A156.11-1991, Cabinet Locks.
  - .3 CAN/CGSB-69.27-93/ANSI/BHMA A156.16-1981, Auxiliary Hardware.
  - .4 CAN/CGSB-69.34-93/ANSI/BHMA A156.18-1987, Materials and Finishes.
  - .5 CAN/CGSB-69.36-M90/ANSI/BHMA A156.20-1984, Strap and Tee hinges and Hasps.

1.3 SUBMITTALS

- .2 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate specified hardware, including make, model, material, function, finish and other pertinent information.
- .3 Hardware List:
  - .1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.
- .5 Closeout Submittals
  - .1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 DELIVERY,  
STORAGE, AND  
HANDLING

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .2 Storage and Protection:
  - .1 Store finishing hardware in locked, clean and dry area.

1.5 WASTE DISPOSAL  
AND MANAGEMENT

- .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 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

PART 2 - PRODUCTS

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's products only for similar items.

2.2 CABINET HARDWARE

- .1 Cabinet hardware: to: CAN/CGSB-69.25, designated by letter B and numeral identifiers listed in Hardware Schedule and as listed below.
  - .1 Hinges: concealed self closing hinge, 170 degree opening, finish to 628 satin aluminum.
  - .2 Pulls: surface mounted pull, "D" type – refer to millwork drawings for specifications.
- .3 Shelf rests and standards: shelf rest installed in holes drilled, type B04013 adjustable shelf standards, type, with open shelf rests, finished to 603 (zinc plated).

- .4 Drawer slides: heavy duty, type B05051, with zinc plate finish, full extension, lift off rail, 34 KG rating, steel ball bearing rollers.

#### 2.4 FASTENINGS

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .2 Exposed fastening devices to match finish of hardware.
- .3 Use fasteners compatible with material through which they pass.

### PART 3 - EXECUTION

#### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

#### 3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.

#### 3.3 ADJUSTING

- .1 Adjust cabinet hardware for optimum, smooth operating condition.
- .2 Lubricate hardware and other moving parts.
- .3 Adjust cabinet hardware to provide tight fit at contact points with frames.

#### 3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
- .3 Remove protective material from hardware items where present.

- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 SCHEDULE

- .1 Refer to Drawings

END OF SECTION



PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

1.2 REFERENCES

- .1 Aluminum Association
  - .1 Designation for Aluminum Finishes-1997.
- .2 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C 36/C 36M-01, Specification for Gypsum Wallboard.
  - .2 ASTM C 79/C 79M-01, Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.
  - .3 ASTM C 442/C 442M-01, Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.
  - .4 ASTM C 475-01, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .5 ASTM C 514-01, Specification for Nails for the Application of Gypsum Board.
  - .6 ASTM C 557-99, Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
  - .7 ASTM C 630/C 630M-01, Specification for Water-Resistant Gypsum Backing Board.
  - .8 ASTM C 840-01, Specification for Application and Finishing of Gypsum Board.
  - .9 ASTM C 954-00, 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.
  - .10 ASTM C 960/C 960M-01, Specification for Pre-decorated Gypsum Board.
  - .11 ASTM C 1002-01, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - .12 ASTM C 1047-99, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - .13 ASTM C 1280-99, Specification for Application of Gypsum Sheathing Board.
  - .14 ASTM C 1177-01, Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - .15 ASTM C 1178/C 1178M-01, Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .3 Association of the Wall and Ceilings Industries International (AWEI)
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.5 Underwriters' Laboratories of Canada (ULC)  
.1 CAN/ULC-S102-1988(R2000), Surface Burning Characteristics of Building Materials and Assemblies.

1.3 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.
- .2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.
- .3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.

1.4 SITE  
ENVIRONMENTAL  
REQUIREMENTS

- .1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours 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.

1.5 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 300 x 300 mm size samples of vinyl faced gypsum board and 300 mm long samples of corner and casing beads, vinyl mouldings, shadow mould, cornice cap, textured finishes and insulating strip.

1.6 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - 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 and corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Departmental Representative.

- .5 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.
- .6 Divert unused wood materials from landfill to recycling composting facility approved by Departmental Representative.
- .7 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Departmental Representative.
- .8 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Standard board: to ASTM C 36/C 36M regular, 16 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges squared.
- .2 Metal furring runners, hangers, tie wires, inserts, anchors: to ASTM C 1047, galvanized.
- .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 C 514.
- .6 Steel drill screws: to ASTM C 1002.
- .7 Stud adhesive: to CAN/CGSB-71.25, ASTM C 557.
- .8 Laminating compound: as recommended by manufacturer, asbestos-free.
- .9 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, metal, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .10 Sealants: in accordance with Section 07 92 00 - Joint Sealing.
- .11 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .12 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.
- .13 Joint compound: to ASTM C 475, asbestos-free.

2.2 FINISHES

- .1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.

PART 3 - EXECUTION

3.1 ERECTION

- .1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C 1280.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, etc., on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across studs, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.

- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

### 3.2 APPLICATION

- .1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.
- .2 Apply single or double layer gypsum board (as specified on drawings) to metal furring or framing using screw fasteners for first layer and screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.
  - .1 Single-Layer Application:
    - .1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C 840.
    - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
  - .2 Double-Layer Application:
    - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
    - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
    - .3 Apply base layers at right angles to supports unless otherwise indicated.
    - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .3 Apply single layer gypsum board to concrete or concrete block surfaces, where indicated, using laminating adhesive.
  - .1 Comply with gypsum board manufacturer's recommendations.
  - .2 Brace or fasten gypsum board until fastening adhesive has set.
  - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 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, etc., in partitions where perimeter sealed with acoustic sealant.
- .5 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .6 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .7 Install gypsum board with face side out.
- .8 Do not install damaged or damp boards.

- .9 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

### 3.3 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 using contact adhesive for full length.
- .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 insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of preformed units two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- .7 Provide continuous polyethylene dust barrier behind and across control joints.
- .8 Locate control joints where indicated at approximate 15 m spacing on ceilings.
- .9 Install control joints straight and true.
- .10 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .11 Install expansion joint straight and true.
- .12 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .13 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .14 Splice corners and intersections together and secure to each member with 3 screws.
- .15 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.

- .16 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.
- .17 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:
  - .1 Levels of finish:
    - .3 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
- .18 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.
- .19 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.
- .20 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .21 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .22 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .23 Mix joint compound slightly thinner than for joint taping.
- .24 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.
- .25 Allow skim coat to dry completely.
- .26 Remove ridges by light sanding or wiping with damp cloth.
- .27 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

3.4 SCHEDULES

- .1 Construct fire rated assemblies where indicated.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .3 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCES

- .1 ASTM International
  - .1 ASTM C 645-[11a], Standard Specification for Nonstructural Steel Framing Members.
  - .2 ASTM C 754-[11], Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Environmental Choice Program (ECP)
  - .1 CCD-047-[98(R2005)], Architectural Surface Coatings.
  - .2 CCD-048-[95(R2006)], Surface Coatings - Recycled Water-Borne.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - [current edition].
    - .1 MPI #26, Primer, Galvanized Metal, Cementitious.
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

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 [metal framing] and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Not Applicable.



1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance 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 indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect metal framing from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C 645, stud sizes as indicated, roll formed hot dipped galvanized steel sheet, for screw attachment of gypsum board.
- .2 Floor and ceiling tracks: to ASTM C 645, 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: in accordance with Section 07 92 00 - Joint Sealants.
- .5 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Landlord and Consultant(s).
  - .2 Inform Landlord and Consultant(s) of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and approved by Landlord and Consultant(s).

#### 3.2 ERECTION

- .1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum or as indicated on drawings.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 300 mm on centre, or as indicated on drawings and not more than 50 mm from abutting walls, and at each side of openings and corners.
  - .1 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, crimp method, pop rivets or as indicated on drawings.
- .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.
  - .1 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.
- .10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs.
  - .1 Secure track to studs at each end, in accordance with

manufacturer's instructions.

.2 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 ceiling height except where noted otherwise on drawings.
- .15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
- .16 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .17 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

### 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.

### 3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by non-structural metal framing application.

END OF SECTION

## PART 1 - GENERAL

### 1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
  - .1 ANSI A108.1-99, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).
  - .2 CTI A118.3-92, Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).
  - .3 CTI A118.4-92, Specification for Latex Cement Mortar (included in ANSI A108.1).
  - .4 CTI A118.5-92, Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1).
  - .5 CTI A118.6-92, Specification for Ceramic Tile Grouts (included in ANSI A108.1).
- .2 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C 144-04, Specification for Aggregate for Masonry Mortar.
  - .2 ASTM C 207-06, Specification for Hydrated Lime for Masonry Purposes.
  - .3 ASTM C 847-06, Specification for Metal Lath.
  - .4 ASTM C 979-05, Specification for Pigments for Integrally Coloured Concrete.
- .3 Canadian General Standards Board (CGSB)
  - .1 CGSB 71-GP-22M-78(AMEND.), Adhesive, Organic, for Installation of Ceramic Wall Tile.
  - .2 CAN/CGSB-75.1-M88, Tile, Ceramic.
- .4 Canadian Standards Association (CSA International)
  - .1 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.
  - .2 CAN/CSA-A3000-03(R2006), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

### 1.3 ACTION AND INFORMATIONAL

- .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.
  - .1 Include manufacturer's information on:
    - .1 Ceramic tile, marked to show each type, size, and shape required.
    - .2 Chemical resistant mortar and grout (Epoxy and Furan).
  - .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
    - .1 Wall tile: submit 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.

1.4 QUALITY ASSURANCE

- .1 Quality Assurance Submittals:
  - .1 Manufacturer's Instructions: follow manufacturer's installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with manufacturer's instructions.
- .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.

1.6 AMBIENT CONDITIONS

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and 48 hours after, installation.
- .2 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.
- .3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

1.8 MAINTENANCE

- .1 Maintenance material same production run as installed material.

PART 2 - PRODUCTS

2.1 FLOOR TILE

- .1 Porcelain tile: to [CAN/CGSB-75.1 ANSI A118.4](#), Class MR (02 - 3.0%), 304 x 304 mm size, edges, matte, slip resistant surface,

beige speckle pattern, beige colour as selected by Departmental Representative

- .2 Porcelain tile: to [CAN/CGSB-75.1](#) ANSI A118.4, Class MR (02 - 3.0%), 152 x 610 mm size, edges, matte, slip resistant surface, polished pattern, black colour as selected by Departmental Representative. Matching square base 152 x 101.6mm high.

## 2.2 WALL TILE

- .1 Ceramic tile: to [CAN/CGSB-75.1](#), Type 3, 152 x 152 mm size, square edges, glazed surface, solid pattern, off white/beige colour as selected by Departmental Representative. Brushed stainless steel edge trim at exposed edges.
- .2 Ceramic tile: to [CAN/CGSB-75.1](#), Type 3, 152 x 152 mm size, square edges, glazed surface, solid pattern, light brown colour as selected by Departmental Representative.
- .3 Ceramic mosaic tile: to [CAN/CGSB-75.1](#), Type 1, 51 x 51 mm size, square edges, matte surface, solid pattern, black colour as selected by Departmental Representative.

## 2.2 MORTAR AND ADHESIVE MATERIALS

- .1 Cement: to CSA-A5, type 10.
- .2 Sand: to ASTM C 144, passing 16 mesh.
- .3 Hydrated lime: to ASTM C 207, Type N NA S SA.
- .4 Latex additive: formulated for use in cement mortar and thin set bond coat.
- .5 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.

## 2.7 BOND COAT

- .1 Dry set cement mortar: to ANSI A108.1.
- .2 Organic adhesive: to CGSB 71-GP-22M, Type 1 ANSI A136.1.
- .3 Latex Cement mortar: to ANSI A108.1, two-component universal dry-set mortar.
- .4 Epoxy bond coat: non-toxic, non-flammable, non-hazardous during storage, mixing, application, and when cured. To produce shock

and chemical resistant mortars having the following physical characteristics:

- .1 Compressive Strength: 246 kg/cm<sup>2</sup>.
- .2 Bond Strength: 53 kg/cm<sup>2</sup>.
- .3 Water Absorption: 4.0% Max.
- .4 Ozone Resistance, 200 hours @ 200 ppm: no loss of strength.
- .5 Smoke Contribution Factor: 0.
- .6 Flame Contribution Factor: 0.
- .7 Finished mortar and grout to be resistant to urine, dilute acid, dilute alkali, sugar, brine and food waste products, petroleum distillates, oil and aromatic solvents.

## 2.8 GROUT

- .1 Colouring Pigments:
  - .1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C 979.
  - .2 Colouring pigments to be added to grout by manufacturer.
  - .3 Job coloured grout are not acceptable.
  - .4 Use in Commercial Cement Grout, Dry-Set Grout, and Latex Cement Grout.
- .2 Cement Grout: to ANSI A108.1.
  - .1 Use one part white cement to one part white sand passing a number 30 screen.
- .3 Commercial Cement Grout: to CTI A118.6.
- .4 Dry-Set Grout: to CTI A118.6.
- .5 Latex Cement Grout: to ANSI A108.1, fast curing, high early strength, polymer-modified, stain resistant, sanded mix for floors, unsanded mix for walls and floors with polished tiles commercial tile grout.
- .6 Chemical-Resistant Grout:
  - .1 Epoxy grout: to ANSI A108.1, having quality, colour and characteristics to match epoxy bond coat. Adhesive and grout by same manufacturer.
  - .2 Furan grout: to CTI A118.5.

## 2.9 ACCESSORIES

- .1 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.

## 2.10 MIXES

- .1 Cement:
  - .1 Scratch coat: 1 part cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand.
  - .2 Slurry bond coat: cement and water mixed to creamy paste. Latex additive may be included.
  - .3 Mortar bed for walls and ceilings: 1 part cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand and 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.
  - .4 Leveling coat: 1 part cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water including latex additive.
  - .5 Bond or setting coat: 1 part cement, 1/3 part hydrated lime, 1 part water.
  - .6 Measure mortar ingredients by volume.
- .2 Dry set mortar: mix to manufacturer's instructions.
- .3 Mix bond and leveling coats, and grout to manufacturer's instructions.
- .4 Adjust water volumes to suit water content of sand.

## 2.11 PATCHING AND LEVELLING COMPOUND

- .1 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.
- .2 Have not less than the following physical properties:
  - .1 Compressive strength - 25 MPa.
  - .2 Tensile strength - 7 MPa.
  - .3 Flexural strength - 7 MPa.
  - .4 Density - 1.9.
- .3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.



- .4 Ready for use in 48 hours after application.

2.12 CLEANING  
COMPOUNDS

- .1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- .2 Materials containing acid or caustic material are not acceptable.

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 WORKMANSHIP

- .1 Do tile work in accordance with TTMAC Tile Installation Manual 2006/2007, "Ceramic Tile", except where specified otherwise.
- .2 Apply tile to clean and sound surfaces.
- .3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.
- .4 Maximum surface tolerance 1:800.
- .5 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.
- .6 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .7 Sound tiles after setting and replace hollow-sounding units to obtain full bond.

- .8 Make internal angles square, external angles square.
- .9 Use square edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.
- .10 Allow minimum 24 hours after installation of tiles, before grouting.
- .12 Clean installed tile surfaces after installation and grouting cured.

3.3 WALL TILE

- .1 Install in accordance with TTMAC details

3.9 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
  - .1 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.

3.10 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .3 Section 01 45 00 - Quality Control.
- .4 Section 01 78 00 - Closeout Submittals.
- .5 Section 09 22 27 - Acoustical Suspension: Suspension system.

1.2 References

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM E 1264-98, Classification for Acoustical Ceiling Products.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
  - .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Canadian Standards Association (CSA)
  - .1 CSA B111-74(R1998), Wire Nails, Spikes and Staples.
- .4 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102-88(R2000), Surface Burning Characteristics of Building Materials.

1.3 Samples

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate full size samples of each type acoustical units.

1.4 Qualifications

- .1 The work of this Section shall be fabricated by a Contractor with minimum five (5) years experience in the actual fabrication of the specified products.

1.5 Mock-up

- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up 10 m<sup>2</sup> minimum of each type acoustical tile ceiling including one inside corner and one outside corner.

- .3 Construct mock-up where directed.
- .4 Allow 24 hours for inspection of mock-up by Departmental 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.

1.6 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

1.7 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.

1.8 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 site, upon completion of the work of this section.
- .6 Store where directed by Project Manager.

PART 2 - PRODUCTS

2.1 Materials

- .1 Acceptable material: Armstrong Ceiling Tiles suitable for moisture prone areas.
- .2 **ACT-1** Acoustic units for suspended ceiling in areas noted on drawings: to CAN/CGSB-92.1.
  - .1 Refer to Materials and Finishes Schedule and floor plans for locations of tile.
  - .2 Mineral core tile with reinforced mat face
  - .3 Flame spread rating of 25 or less in accordance with CAN/ULC-S102.
  - .4 Smoke developed 25 or less in accordance with CAN/ULC-S102.
  - .5 Noise reduction coefficient (NRC) designation of .55.
  - .6 Ceiling Attenuation Class (CAC) rating 38, in accordance with

ASTM E 1264

- .7 Light reflectance range of .82.
  - .8 Edge type: trim/square.
  - .9 Colour white.
  - .10 Size 24" x 24" x 3/4" thick.
  - .11 Shape flat.
- 
- .3 Adhesive: low VOC type recommended by acoustic unit manufacturer.
  - .4 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.
  - .5 Polyethylene: to CAN/CGSB-51.34, 0.15 mm thick.
  - .6 Hold down clips: purpose made clips to secure tile to suspension system, approved for use in fire-rated systems. Not required.

PART 3 - EXECUTION

3.1 Examination

- .1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Departmental Representative.

3.2 Installation

- .1 Install acoustical panels and tiles in ceiling suspension system.

3.3 Application

- .1 Install screwed acoustic units to clean, dry and firm substrate.
- .2 Install acoustical units parallel to building lines with edge unit not less than 50% of unit. Refer to reflected ceiling plan.
- .3 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

3.4 Interface With Other Work

- .1 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.

END OF SECTION

## PART 1 - GENERAL

### 1.0 COMMENTARY

Interior paints are sources of serious exposure to trades and building occupants throughout their curing period. The period may take several weeks depending on the product. To minimize the impact of the curing process, use low odour water based paints meeting EcoLogo standards for reducing solvent content.

The Airless spraying system is to be utilized for any site spray painting. the contact area must be kept in negative pressure during all painting activities through the use of high capacity construction exhaust fans.

Paint finish should be selected such that they do not create on-going maintenance costs. Matt finishes should not be used for walls or areas which people can touch.

Perimeter fin radiator covers will need to be removed, patched, and blasted, made good, and painted off-site with a Powder Coat process.

Specified paint formulas should contain no mercury, lead, hexavalent chromium or cadmium compounds in their formulation or tints.

### 1.1 SECTION INCLUDES

- .1 Moisture testing of substrates
- .2 Surface preparation of substrates as required for acceptance of paint, including cleaning, small crack repair, patching, caulking, and making good surfaces and areas to limits defined under MPI Repainting Maintenance Manual requirements.
- .3 Specified pre-treatments noted herein or specified in the MPI Repainting Maintenance manual.
- .4 Sealing/ Touch-up, spot priming, and/or full priming surfaces for repainting in accordance with MPI Repainting Maintenance Manual.
- .5 Provision of safe and adequate ventilation as required where toxic and/or volatile/ flammable materials are being used over and above temporary ventilation supplied by others.

### 1.2 RELATED SECTIONS

- .1 Section 01 33 00- Submittal Procedures
- .2 Section 01 74 19 – Construction/ Demolition Waste Management and Disposal
- .3 Section 01 45 00 – Quality Control
- .4 Section 01 61 00 – Common Product Requirements
- .5 Section 01 78 00 – Closeout Submittals
- .6 Section 02 61 33 – Hazardous Materials

.7 Section 09 91 23 Interior painting

1.3 REFERENCES

- .1 The Master Painters Institute (MPI)
  - .1 Maintenance Repainting Manual 2004, Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.
  - .2 Environmental Protection Agency (EPA)
    - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
  - .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .4 National Fire Code of Canada.

1.3 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Contractor: to have a minimum of five years proven satisfactory experience. Provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in repainting work.
  - .3 Apprentices: may be employed provided they work under the direct supervision of qualified journeyperson in accordance with applicable trade regulations.
- .2 Conform to latest MPI requirements for interior repainting work including cleaning, preparation and priming.
- .3 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners and solvents) shall be in accordance with the latest edition of the MPI Approved Product List and shall be from a single manufacturer for each system used.
- .4 Paint materials such as linseed oil, shellac, reducers and turpentine shall be the highest quality product of an approved manufacturer listed in MPI Maintenance Repainting Manual and shall be compatible with other coating materials as required.
- .5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.
- .6 Standard of Acceptance: when viewed using final lighting source surfaces shall indicate the following:
  - .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.
- .3 Final coat to exhibit uniformity of colour and sheen across full surface area.

1.4 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
  - .1 Provide paint products meeting MPI "Environmentally Friendly" E2 rating based on VOC (EPA Method 24) content levels.
  - .2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 E3 rating.
  - .3 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials.
  - .4 Apply paint finish only in areas where dust is no longer being generated by related construction operations such that airborne particles will not affect the quality of the finished surface.

1.5 INSPECTION REQUIRMENTS

- .1 Interior surfaces requiring repainting shall be inspected by both painting contractor and Paint Inspection Agency who shall notify Departmental Representative and General Contractor in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .2 Where an assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DAD-4 after preparation, repair or replacement of such unforeseen defects discovered shall be rectified by others, as mutually agreed, before repainting is started.
- 3. Where "special" repainting or recoating system applications (i.e. elastomeric coatings) of non-MPI listed products or systems are to be used, paint or coatings manufacturer shall provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to the Departmental Representative.

1.6 SCHEDULING

- .1 Submit work schedule for various stages of painting to Departmental Representative for approval review. Submit schedule a minimum of 48 hours in advance of proposed operations.
- .2 Paint occupied facilities in accordance with approved schedule. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.
- .3 Obtain written authorization from Departmental Representative for



changes in work schedule.

- .4 Schedule repainting operations to prevent disruption by other trades if applicable and by occupants in and about building.

### 1.7 SUBMITTALS

- .1 Provide product data and manufacturer's installation/application instructions for each paint and coating product to be used in accordance with the requirements of Section 01 33 00 - Submittal Procedures.
- .2 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit full range colour sample chips for review and selection. Indicate where colour availability is restricted.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets for paint and coating materials.
- .3 Closeout Submittals:
  - .1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
    - .1 Submit records of products used. List products in relation to finish system and include following:
      - .1 Product name, type and use (i.e. materials and location).
      - .2 Manufacturer's product number.
      - .3 Colour code numbers.
      - .4 MPI Environmentally Friendly classification system rating.
      - .5 Manufacturer's Material Safety Data Sheets (MSDS).

### 1.8 DELIVERY, HANDLING AND STORAGE

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
  - .1 Deliver and store materials in original containers, sealed, with labels intact.
  - .2 Labels to indicate:
    - .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 Store and handle in accordance with manufacturer's recommendations.
  - .5 Store materials and equipment in secure, dry, well-ventilated area with temperature range between 7 degrees C to 30 degrees C. Store materials and supplies away from heat generating devices and sensitive products above minimum temperature as recommended by manufacturer.
  - .6 Keep areas used for storage, cleaning and preparation, clean

and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.

.7 Remove paint materials from storage in quantities required for same day use.

.8 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.9 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 daily.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada.

.2 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

.2 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are 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.

.3 Materials that cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case shall equipment be cleaned using free draining water.

.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 an approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.6 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

.6 Where paint recycling is available, collect waste materials by

type and provide for delivery to recycling or collection facility.

## 1.8 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
  - .1 Do not perform repainting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application and until paint has cured sufficiently.
  - .2 Ventilate enclosed spaces in accordance with Section. Where required, provide continuous ventilation for seven days after completion of application of paint.
  - .3 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
  - .4 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. Use of gas-fired appliances is not permitted.
  - .5 Do not perform painting work unless minimum lighting level of 323 Lux is provided on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, do not perform repainting work when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Relative humidity within area to be repainted is above 85 %.
  - .2 Conduct moisture tests using properly calibrated electronic Moisture Meter, except use simple "cover patch test" on concrete floors to be repainted.
  - .3 Do not perform repainting work when maximum moisture content of substrate exceeds:
    - .1 12 % for concrete and masonry (clay and concrete brick/block).
    - .2 15 % for wood.
    - .3 12 % for plaster and gypsum board.
  - .4 Test painted 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 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 noted herein.

.3 Apply paint when previous coat of paint is dry or adequately cured, unless otherwise pre-approved by specific coating manufacturer.

.4 Apply paint in occupied facilities during silent hours only unoccupied rooms or areas. Schedule operations to approval of the Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.9 MAINTENANCE  
(EXTRA MATERIALS)

- .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit one four litre can of each type and colour of stain finish coating. Identify type and colour in relation to established colour schedule and finish system.
- .3 Deliver to Contractor and store where directed.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Paint materials: P1. Refer to drawings.
- .2 Paint materials listed in latest edition of MPI Approved Product List (APL) are acceptable for use on this project.
- .3 Where required by authorities having jurisdiction, paints and coatings to provide a fire resistant rating.
- .4 Paint materials for repaint systems to be products of single manufacturer.
- .5 Only qualified products with MPI "Environmentally Friendly" E2 rating are acceptable for use on this project.
- .6 Paints, coatings, thinners, solvents, cleaners and other fluids used in repainting, to be as follows:
  - .1 Not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
  - .2 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
  - .3 Be manufactured without compounds which contribute to smog in lower atmosphere.
  - .4 Be manufactured where matter generating 'Biochemical Oxygen Demand' (BOD) in undiluted production plant effluent discharged to natural watercourse or a sewage treatment facility lacking secondary treatment does not exceed 15 mg/L.
  - .5 Be manufactured where total suspended solids (TSS) content in undiluted production plant effluent discharged to natural watercourse or sewage treatment facility lacking secondary treatment

does not exceed 15 mg/L.

- .7 Paints and coatings must be manufactured and transported in a manner that steps processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA)
- .8 Paints and coatings must not be formulated or manufactured with formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

## 2.2 COLOURS

- .1 Colours: P1 – refer to Interior Design Drawings.
- .2 Colour schedule will be based upon selection of up to 15 colours.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 First coat in two coat (Premium) repaint 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. On-site tinting of painting materials is allowed with Departmental Representative's written permission.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition not to exceed paint manufacturer's recommendations. Do not use kerosene or such organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer' instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative
- .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 defined as sheen rating of applied paint, in accordance with following MPI gloss / sheen standard values:

Gloss Level	Units @ 60	Units @ 85	
<u>Category</u>		<u>Degrees</u>	<u>Degrees</u>
G1 – matte finish		0 to 5	maximum 10
G2 - velvet finish		0 to 10	10 to 35
G3 - eggshell finish		10 to 25	10 to 35
G4 – satin finish		20 to 35	minimum 35
G5 - semi-gloss finish		35 to 70	70 to 85
G6 - gloss finish		> 85	
G7 - high gloss finish			
	.2		Gloss level ratings of repainted surfaces shall be as specified herein and as noted on Finish Schedule.
<u>2.5 INTERIOR PAINTING SYSTEMS</u>	.1		RIN 5.1 - Structural Steel and Metal Fabrications Including existing steel stair stringers and railing, .1 RIN 5.1A - Quick dry G5. .2 RIN 5.1B - High Performance Acrylic G5. .3 RIN 5.1F - 2 Component Polyurethane. .4 RIN 5.1H - Organic Zinc/Epoxy / 2 Component Polyurethane. .5 RIN5.1N - Latex.
	.2		RIN 5.2 - Steel - High Heat: (Boilers, Furnaces, Heat Exchangers, Breeching, Pipes, Flues, and Stacks). .1 NA
	.3		RIN 5.3 - Galvanized Metal: (High Contact/High Traffic Areas (Doors, Frames, Railings, Pipes, and Handrails). Low Contact/Low traffic areas (Overhead Decking, Pipes, and Ducts). .1 RIN 5.3A - Latex (Low Contact/Traffic) G5. .2 RIN 5.3B - High Performance Acrylic G5. .3 RIN 5.3C - Alkyd G5. .4 RIN 5.3D - 2 Component Epoxy insert gloss level.. .5 RIN 5.3F - Aluminum Paint Finish (Low Contact/Traffic). .6 RIN 5.3G - Waterborne Dry Fall (Low Contact/Traffic). .7 RIN 5.3H - 2 Component Polyurethane.
	.4		RIN 5.4 Aluminum: .1 RIN 5.4A - Alkyd G4. .2 RIN 5.4B - 2 Component Epoxy G4. .3 RIN 5.4C - 2 Component Aliphatic Polyurethane G 4. .4 RIN 5.4D - Aluminum Paint. .5 RIN 5.4E - High Performance Acrylic G4. .6 Maximum VOC limit g/L to SCAQMD Rule 1113.
	.5		RIN 9.1 - Spray Textured Surfaces: (Ceilings). .1 RIN 9.1A - Latex Flat. .2 RIN 9.1B - Latex G3.
	.6		RIN 9.2 - Plaster and Gypsum Board: (gypsum wallboard, drywall, and "sheet rock type material". .1 RIN 9.2B - High Performance Acrylic G4. .2 RIN 9.2C - Alkyd G4 Finish. .3 RIN 9.2J - 2 Component Polyurethane G4.

- .7 Dressed lumber: including floors, doors, frames, casings, mouldings, millwork:
  - .1 INT 6.3A – High performance architectural latex semi-gloss finish.
  - .2 INT 6.3B – Alkyd matte, satin, semi-gloss or high gloss finish.
  - .3 INT 6.3C – Semi-transparent stain finish.
  - .4 INT 6.3D – Alkyd varnish, semi-gloss finish over opaque or semi-transparent stain.
  - .5 INT 6.3E – polyurethane varnish, satin or gloss finish over opaque or semi-transparent stain.
  - .6 INT 6.3F – clear lacquer, satin or diluted gloss finish over opaque or semi-transparent stain.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- .1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Manual requirements except where otherwise specified.
- .2 Apply paint materials in accordance with paint manufacture's written application instructions.

#### 3.2 PREPARATION

- .1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Manual requirements except where otherwise specified.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare interior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using stiff bristle brush to remove dirt, oil and surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and to dry thoroughly. Allow sufficient drying time and test surfaces using an electronic moisture meter before commencing work.
  - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
  - .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements.

Remove such contaminates from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.

- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .6 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.
- .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from distance up to 1000 mm.

### 3.3 EXISTING CONDITIONS

- .1 Prior to commencing work, examine site conditions and existing interior substrates to be repainted. Report in writing to Departmental Representative and General Contractor Project Manager damages, defects, or unsatisfactory or unfavourable conditions or surfaces that will adversely affect this 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" and report findings to Departmental Representative and General Contractor Project Manager. Maximum moisture content not to exceed specified limits.
- .3 Do not commence until such adverse conditions and defects have been corrected and surfaces and conditions are acceptable to Painting Subcontractor and Inspection Agency.
- .4 Degree of surface deterioration (DSD) to be assessed using MPI Identifiers and Assessment criteria indicated in MPI Maintenance Repainting Manual. MPI DSD ratings and descriptions are as follows:

#### Condition Description:

**DSD-0** Sound Surface (includes visual (aesthetic) defects that do not affect film's protective properties).

**DSD-1** Slightly Deteriorated Surface (indicating fading; gloss reduction, slight surface contamination, minor pin holes scratches).

**DSD-2** Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, and staining).

**DSD-3** Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).

**DSD-4** Substrate Damage (repair or replacement of surface required).



### 3.4 PROTECTION

- .1 Protect existing surfaces and adjacent fixtures and furnishings from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such 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 general public and building occupants in and about building.
- .5 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and surface mounted equipment, fittings and fastenings prior to undertaking re-painting operations. Store items and re-install after painting is completed.
- .6 Move and cover furniture and portable equipment as necessary to carry out repainting operations. Replace as painting operations progress.
- .7 As repainting operations progress, place "WET PAINT" signs in occupied areas to approval of Departmental Representative.

### 3.5 APPLICATION

- .1 Apply paint by method that is best suited for substrate being repainted using brush, roller, air sprayer and/or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise. Methods of application as pre-approved by Departmental Representative before commencing work.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller of types 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 unless approved by Departmental Representative.
  - .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 properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application by continuous mechanical agitation or intermittent agitation frequently as necessary.
  - .3 Apply paint in uniform layer, with overlapping at edges of

spray pattern.

.4 Back roll spray applications and brush out runs and sags immediately.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Departmental Representative.

.5 Apply paint coats in continuous manner and allow surfaces to dry and properly cure between coats for minimum time period as recommended by manufacturer. Minimum dry film thickness of coats not less than that recommended by manufacturer. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Sand and dust between coats to remove visible defects.

.7 Repaint 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.

.8 Repaint top, bottom, and vertical edges of doors to be repainted.

### 3.6 MECHANICAL/ ELECTRICAL EQUIPMENT

.1 Unless otherwise noted, repainting to include exposed to view / previously painted mechanical and electrical equipment and components (panels, conduits, piping, hangers, and ductwork.).

.2 Touch up scratches and marks and repaint such mechanical and electrical equipment and components with colour, and sheen finish to match existing unless otherwise noted or scheduled.

.3 Do not paint over name plates or instruction labels.

.4 Leave unfinished exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish.

.5 Keep sprinkler heads free of paint.

.6 Do not paint interior transformers and substation equipment.

.7 Standard of Acceptance: when viewed using natural prevailing sunlight at peak period of day (mid-day) on surface viewed, surfaces to indicate following:

.1 Walls: no defects visible from distance of 1000 mm at 90 degrees to surface.

.2 Soffits: no defects visible from grade at 45 degrees to surface.

.3 Final coat to exhibit uniformity of colour and sheen across full surface area.

3.7 FIELD QUALITY CONTROL

- .1 Inspection:
- .1 Advise Departmental Representative when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
  - .2 Co-operate with Paint Inspection Agency and provide access to areas of work.

3.8 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning, supplemented as follows:
- .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
  - .2 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials and debris.
  - .3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.
  - .4 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil based materials as well as other cleaning and protective materials (e.g. rags, drop cloths, and masking papers), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction and as noted herein.
  - .5 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Sediment remaining from cleaning operations to be recycled or disposed of in manner acceptable to authorities having jurisdiction.
  - .6 Recycle paint and coatings in excess of repainting requirements as specified.

3.09 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 affected exposed surfaces. 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 74 19 - Construction/Demolition Waste Management And Disposal.
- .3 Section 02 61 33 - Hazardous Materials.
- .4 Section 01 45 00 - Quality Control.
- .5 Section 01 78 00 - Closeout Submittals.
- .6 Section 06 20 00 - Finish Carpentry.
- .7 Section 06 40 00 - Architectural Woodwork.

1.2 References

- .1 Architectural Painting Specifications Manual, Master Painters Institute (MPI).
- .2 Systems and Specifications Manual, SSPC Painting Manual, Volume Two, Society for Protective Coatings (SSPC).
- .3 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings) of the Environmental Protection Agency (EPA).
- .4 National Fire Code of Canada.

1.3 Quality Assurance

- .1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Qualified journeymen who have a "Tradesman Qualification Certificate of Proficiency" shall be engaged in painting work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.
- .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.) shall be in accordance with MPI Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.
- .5 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other

coating materials as required.

- .6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.
- .7 Standard of Acceptance:
  - .1 Walls: No defects visible from a distance of 1000 mm at 90° to surface.
  - .2 Ceilings: No defects visible from floor at 45° to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.4 Environmental Performance Requirements

- .1 Provide paint products meeting MPI "Environmentally Friendly" E1, E2 ratings based on VOC (EPA Method 24) content levels.
- .2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 rating.

1.5 Inspection Requirements

- .1 Interior painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and local Painting Contractor's Association. Painting contractor shall notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
- .2 Interior surfaces requiring painting shall be inspected by Paint Inspection Agency who shall notify Departmental Representative and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
- .3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer shall provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.

1.6 Scheduling of Work

- .1 Submit work schedule for various stages of painting to Departmental Representative for approval. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Departmental Representative for any changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.7 Submittals

- .1 Submit product data and manufacturer's installation/application instructions for each paint and coating product to be used in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Submit WHMIS MSDS.- Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.
  - .3 Upon completion, submit records of products used. List products in relation to finish system and include the following:
    - .1 Product name, type and use.
    - .2 Manufacturer's product number.
    - .3 Colour number[s].
    - .4 MPI Environmentally Friendly classification system rating.
    - .5 Manufacturer's Material Safety Data Sheets (MSDS).
- 1.8 Samples
- .1 Submit full duplicate range colour sample chips in accordance with Section 01 33 00 - Submittal Procedures. 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 Painting Specification Manual standards submitted on the 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 When approved, sample panels shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.
- 1.9 Quality Control
- .1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
  - .2 When requested by Departmental Representative, prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.
- 1.10 Extra Materials
- .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  - .2 Submit one - four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
  - .3 Deliver to Contractor and store where directed.
- 1.11 Delivery, Handling and
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

Storage

- .2 Labels shall clearly indicate:
  - .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 Provide and maintain dry, temperature controlled, secure storage.
- .5 Observe manufacturer's recommendations for storage and handling.
- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in a well ventilated area with temperature range 7° C to 30° C.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
- .10 Remove paint materials from storage only in quantities required for same day use.
- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC 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 the National Fire Code of Canada.

1.12 Site Requirements

- .1 Heating, Ventilation and Lighting:
  - .1 Ventilate enclosed spaces in accordance with manufacturer recommendations.
  - .2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 ° C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
  - .4 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.

.5 Perform no painting work unless a minimum lighting level of 323Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by the specifying body, Paint Inspection Agency and the applied product manufacturer, perform no painting work when:

.1 Ambient air and substrate temperatures are below 10 ° C.

.2 Substrate temperature is over 32° C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 The relative humidity is above 85% or when the dew point is less than 3 ° C variance between the air/surface temperature.

.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

.2 Perform no painting work when the maximum moisture content of the substrate exceeds:

.1 12% for concrete and masonry (clay and concrete brick/block).

.2 15% for wood.

.3 12% for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:

.1 Apply paint finish only 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 only to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint only when previous coat of paint is dry or adequately cured.

.4 Additional Interior Application Requirements:

.1 Apply paint finishes only 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.



1.13 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.,) 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.
- .3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground the following procedures shall be strictly adhered to:
  - .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 an approved legal manner in accordance with hazardous waste regulations.
  - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .6 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .7 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection for verifiable re-use or re-manufacturing.
- .8 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

PART 2 - PRODUCTS

2.1 Materials

- .1 Paint Materials: P1. Refer to drawings.
- .2 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .3 Paint materials for paint systems shall be products of a single manufacturer.
- .4 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.

- .5 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:
  - .1 be water-based.
  - .2 be biodegradable.
  - .3 be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
  - .4 be manufactured without compounds which contribute to smog in the lower atmosphere.
  - .5 do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .6 Water-borne surface coatings must be manufactured and transported in a manner that steps of process, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .7 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .8 Water-borne surface coatings and recycled water-borne surface coatings must have a flash point of 61.0° C or greater.
- .9 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
  - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of [15] mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .10 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.
- .11 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.
- .12 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 3.0ppm weight/weight total product.
  - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.
- .13 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and

canned. These tests must be performed at a laboratory or facility which has been accredited by the 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.

## 2.2 Colours

- .1 Departmental Representative will provide Colour in Materials and Finishes Schedule.
- .2 Colour schedule will be based upon the selection of four base colours. No more than eight colours will be selected for the entire project.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in a restricted range of colours, selection will be based on the limited range.
- .5 Second coat in a 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. On-site tinting of painting materials is allowed only with Departmental Representative's written permission.
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.
- .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 shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level Category	Units @ 60°	Units @ 85°
G1 – matte finish	0 to 5	max. 10
G2 – velvet finish	0 to 10	10 to 35

G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces shall be as specified herein and as noted on Finish Schedule.

2.5 Interior  
Painting Systems

- .1 Concrete Vertical Surfaces: including horizontal soffits  
.1 INT 3.1C High performance architectural latex semi-gloss finish.
- .2 Concrete Masonry Units: smooth and split face block and brick  
.1 INT 4.2D High performance architectural latex semi-gloss finish.
- .3 Structural Steel and Metal Fabrications: columns, beams, joists, etc.  
.1 INT 5.1R High performance architectural latex semi-gloss finish.
- .4 Steel - High Heat: (boilers, furnaces, heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted)  
.1 INT 5.2A Heat resistant enamel finish, maximum 205° C.
- .5 Galvanized Metal: doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etc.  
.1 INT 5.3M High performance architectural latex semi-gloss finish.
- .6 Dressed Lumber: including doors, door and window frames, casings, mouldings, etc.  
.1 INT 6.3A High performance architectural latex semi-gloss finish.
- .7 Wood Paneling and Casework: partitions, panels, shelving, millwork, etc.  
.1 INT 6.4C Semi-transparent stain finish.
- .8 Plastic: lumber, panels, trims, fabrications, vinyl wall covering, PVA/PVC materials, etc.  
.1 INT 6.8A High performance architectural latex semi-gloss finish.
- .9 Spray Textured Surfaces: ceilings  
.1 INT 9.1A Latex flat finish spray application only.
- .10 Plaster and Gypsum Board: gypsum wallboard, drywall, "sheet rock type material", etc., and textured finishes  
.1 INT 9.2B High performance architectural latex semi-gloss finish.
- .11 Bituminous Coated Surfaces: cast iron pipe, concrete, etc.  
.1 INT 10.2A Latex semi-gloss finish.

- 2.6 Special Finishes .1 Electromagnetic paint for refinishing of existing heater covers.

PART 3 - EXECUTION

- 3.1 General .1 Perform preparation and operations for interior painting in accordance with MPI Painting Specifications Manual except where specified otherwise.

- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

- 3.2 Existing Conditions .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. Existing surfaces to be repainted as follows:
- .1 Existing ceiling diffusers. Rust is showing. Remove rust and prepare for electrostatic paint. Refer to drawings for locations.
  - .2 Existing glass frames. Refer to drawings for locations.
  - .3 Existing heavy stippled ceiling in Lobbies.
  - .4 Existing vertical surfaces, bulkheads and beam surrounds, smooth plaster surface. Note that the vertical surfaces overlooking the open Atrium to be a separate price.

- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Departmental Representative. 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%.

- 3.3 Protection .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 such 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, and general public in and about the building.

- .5 Removal of electrical cover plates, light fixtures, surface hardware on

doors and other surface mounted equipment, fittings and fastenings shall be done prior to undertaking any painting operations by General Contractor. Items shall be securely stored and re-installed after painting is completed by General Contractor.

3.4 Cleaning and Preparation

- .6 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in occupied areas to approval of Departmental Representative.
- .1 Clean and prepare surfaces in accordance with MPI Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming,]wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent [and bleach where applicable] and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.
- .2 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.
- .3 Where possible, prime 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.
- .4 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.
- .5 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, or vacuum cleaning.
- .6 Touch up of shop primers with primer as specified in applicable

section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.

.7 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

### 3.5 Application

.1 Method of application to be as approved by Departmental Representative. Apply paint by brush & roller. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in a uniform layer using brush and/or roller of types 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 shall be free of roller tracking and heavy stipple unless approved by Departmental Representative.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Departmental Representative.

.5 Apply coats of paint as a 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 closets and alcoves as specified for adjoining rooms.

.10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

### 3.6 Mechanical/Electrical Equipment

.1 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
  - .4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
  - .5 Do not paint over nameplates.
  - .6 Keep sprinkler heads free of paint.
  - .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
  - .8 Paint fire protection piping red.
  - .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
  - .10 Paint natural gas piping yellow.
  - .11 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.
  - .12 Do not paint interior transformers and substation equipment.
- 3.7 Field Quality Control
- .1 Field inspection of painting operations to be carried out by independent inspection firm as designated by Departmental Representative.
  - .2 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- 3.8 Restoration
- .1 Co-operate with inspection firm and provide access to areas of work.
  - .1 Clean and re-install all 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.

END OF SECTION



PART 1 - GENERAL

1.1 RELATED  
REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures

1.2 REFERENCES

- .1 ASTM International
  - .1 ASTM A 167-[99(2009)], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM A 240/A 240M-[12], Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .3 ASTM A 480/A 480M-[12], Standard Specification for General Requirements for Flat-Rolled Stainless and Heat Resisting Steel Plate, Sheet, and Strip.
  - .4 ASTM A 653/A 653M-[11], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA International
  - .1 CSA B651-[12], Accessible Design for the Built Environment.
- .3 Green Seal Environmental Standards (GS)
  - .1 GS-11-[11], Standard for Paints and Coatings.
  - .2 GS-36-[11], Standard for Commercial Adhesives.

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 metal toilet compartments and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Installation Drawings:
  - .1 Submit installation drawings
  - .2 Indicate fabrication details, plans, elevations, hardware, and installation details.
- .4 Samples:
  - .1 Submit duplicate [300 x 300 mm] samples of panel showing finished edge and corner construction and core construction.
  - .2 Submit duplicate representative samples of hardware items, including brackets, fastenings and trim.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect metal toilet compartments from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Metal toilet partitions.
- .2 Sheet steel: commercial quality to ASTM [A480/480M] [A653/A653M] with ZF001 designation zinc coating.
- .3 Minimum base steel thickness:
  - .1 Panels and doors: 0.8 mm.
  - .2 Pilasters: 1.0 mm.
  - .3 Reinforcement: 3.0 mm.
- .4 Stainless steel sheet metal: to ASTM [A167] [A240/A240M]
- .5 Headrails: clear anodized, extruded aluminum, anti grip design tubular steel, cast end preformed socket brackets.
- .6 Pilaster [shoe] [ceiling trim]: [[0.8] mm stainless steel] [chrome plated non-ferrous], [75] mm high.
- .7 Attachment: [zinc-plated steel] [stainless steel] [chrome plated] [aluminum] tamperproof type screws and bolts.

2.2 COMPONENTS

- .1 Hinges:
  - .1 Heavy duty, non-lubricating, nylon bushings.

- .2 Material/finish: stainless steel
- .3 Swing: inward
- .4 Return movement: gravity
- .5 Emergency access feature.

- .2 Latch set: built-in, combination latch, combination door-stop, keeper and bumper, anodized aluminum, emergency access feature
- .3 Wall and connecting brackets: anodized aluminum extrusion or casting.
- .4 Coat hook: combination hook and rubber door bumper, stainless steel

### 2.3 FABRICATION

- .1 Doors, panels and screens: 25 mm thick, two steel sheets faces pressure bonded to honeycomb core, to sizes indicated on drawings.
- .2 Pilasters: 32 mm thick, constructed same as door, to sizes indicated on drawings.
- .3 Include formed and closed edges for doors, panels and pilasters.
  - .1 Miter and weld corners and grind smooth.
- .4 Include internal reinforcement at areas of attached hardware and fittings.
  - .1 Temporarily mark location of reinforcement for [tissue holders] [and grab bars].

### 2.4 FINISHES

- .1 Clean, degrease and neutralize steel components with phosphate or chromate treatment.
- .2 Spray apply primer to CAN/CGSB-1.81, [1] coat.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metal toilet compartment 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 MANUFACTURER'S INSTRUCTIONS

- . 1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.3 PREPARATION

- . 1 Ensure supplementary anchorage, if required, is in place.

3.4 ERECTION

- . 1 Do work in accordance with CSA B651.
- . 2 Partition erection.
  - . 1 Install partitions secure, plumb and square.
  - . 2 Leave 12 mm space between wall and panel or end pilaster.
  - . 3 Anchor mounting brackets to masonry/concrete surfaces using screws and shields: [blocking/backing must be provided] to hollow walls using bolts and toggle type anchors, [to steel supports with [threaded rods nuts and washers] [bolts in threaded holes]].
  - . 4 Attach panel and pilaster to brackets [with self-drilling screws] with through type sleeve bolt and nut.
  - . 5 Allow for adjustment of [floor-braced pilasters] [ceiling] variations with screw jack through steel saddles made integral with pilaster.
  - . 6 Include drilling dimensions for locating threaded studs through finished ceilings.
- . 3 Ceiling hung partition erection.
  - . 1 Secure pilasters to supporting structural framing using pilaster hangers.
  - . 2 Ensure pilaster hangers do not transmit load to finished ceiling.
  - . 3 Secure pilaster shoe in position.
  - . 4 Set bottoms of doors level with bottom of pilasters when doors are in closed position.
- . 4 Floor supported and overhead braced partition erection.
  - . 1 Attach pilasters to floor with [pilaster supports] [floor channel adjust] and level, plumb, and tighten installation with [levelling device] [secure to floor channel].
    - . 1 Secure pilaster shoes in position.
    - . 2 Secure headrail to pilaster face with not less than two fasteners per face.
    - . 3 Set tops of doors parallel with overhead brace when doors are in closed position.
  - . 2 Floor supported partition erection.
    - . 1 Secure pilasters to floor with pilaster supports anchored with minimum [50] mm penetration in structural floor.

- .2 Level, plumb and tighten installation with levelling device.
  - .3 Secure pilaster shoes in position.
  - .4 Set tops of doors level with tops of pilasters when doors are in closed position.
  - .3 Screens erection:
    - .1 Include [urinal stall] [entrance] screens consisting of panel [and post], pilaster [and] [headrail] [as specified for toilet compartments] [as indicated].
    - .2 Anchor [wall-hung] screen panels to walls with [2] [3] panel brackets [and wing brackets] and [vertical upright consisting of tubular headrail stock and end sockets] [pilaster complete with floor and ceiling shoes], anchored to [floor] [and] [ceiling].
- 
- 3.5 ADJUSTING
- .1 Adjust doors and locks for optimum, smooth operating condition.
  - .2 Lubricate hardware and other moving parts.
- 
- 3.6 CLEANING
- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
  - .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- 
- 3.7 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].
    - .1 Clean surfaces after installation using manufacturer's recommended cleaning procedures.
    - .2 Clean aluminum with damp rag and approved non-abrasive cleaner.
    - .3 Clean and polish hardware and stainless components.
- 
- 3.8 PROTECTION
- .1 Protect installed products and components from damage during construction.
  - .2 Repair damage to adjacent materials caused by metal toilet compartment installation.

END OF SECTION

**PART 1 - GENERAL**

- 1.1 General .1 This section covers items common to all sections of Divisions 21, 22 & 23.
- .2 Coordinate location & installation of all equipment with all trades to ensure the equipment is serviceable.
- .3 Prime mechanical contractor shall be responsible to ensure that all requirements of Divisions 21, 22 & 23 are met and comply with all other divisions and contract documents.
- .4 The word "provide" shall mean "supply and install".
- .5 Conform to the requirements of Division 00, Division 01 and Instructions to Tenderers.
- 1.2 Equipment .1 General:
- .1 Provide new materials and equipment of proven design, quality and of current models with published ratings for which replacement parts are readily available.
- .2 Uniformity: Use product of one manufacturer unless otherwise specified, for equipment or material of the same type of classification.
- .2 Installation:
- .1 Unions, flanges and/or couplings: provide for ease of maintenance and disassembly.
- .2 Space for servicing, disassembly and removal of equipment and components: provide as recommended by manufacturer, Code or as indicated; whichever is the more stringent.
- .3 Equipment drains: pipe to floor drains in a manner which is non-obstructing.
- .4 Install equipment, rectangular cleanouts and similar items parallel to or perpendicular to building lines.
- .5 Unless otherwise specified, follow manufacturer's recommendations for safety, adequate access for inspection, maintenance and repairs.
- .6 Permit equipment maintenance and disassembly with minimum disturbance to connecting piping and duct systems without interference with building structure or other equipment.
- .7 Lubrication: Provide accessible lubricating means for bearings, including permanent lubrication "Lifetime" bearings. Extended grease nipples to be supplied.
- 1.3 Anchor Bolts and Templates .1 Supply anchor bolts and templates for installation by other divisions.
- 1.4 Protection of Openings .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

- 1.5 Preparation for Firestopping
- .1 Firestopping material and installation within annular space between pipes, ducts, insulation and adjacent fire separation: specified in Section 07 84 00 - Fire Stopping.
  - .2 Uninsulated unheated pipes not subject to movement: no special preparation.
  - .3 Uninsulated heated pipes subject to movement: wrap with non-combustible smooth material to permit pipe to move without damaging firestopping material.
  - .4 Insulated pipes and ducts: ensure integrity of insulation and vapour barrier at fire separation.
- 1.6 Demonstration Operating and Maintenance Instructions
- .1 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
  - .2 Where specified elsewhere in Divisions 21, 22 & 23, manufacturers to provide demonstrations and instructions.
  - .3 Use operation and maintenance manual, as-built drawings, audio visual aids, etc. as part of instruction materials.
  - .4 Instruction duration time requirements as specified in appropriate sections.
  - .5 Where deemed necessary, Owner may record these demonstrations on video tape for future reference.
  - .6 Furnish trained instructors to instruct Owner's operating staff in the operation, maintenance and adjustment of all mechanical equipment; and, instruct personnel on any changes to or modifications of any equipment made under terms of the guarantee.
  - .7 The instructions shall take place during regular working hours before systems are accepted and turned over to Owner's staff.
  - .8 Ensure that the Owner's operating personnel have received and been given opportunity to review the Operating and Maintenance Manuals prior to commencing instruction. Allow two full days on site for review of these manuals with Owner's personnel and for their instruction in operation and maintenance of all mechanical equipment.
- 1.7 Closeout Submittals
- .1 Submit operation and maintenance data for incorporation into manual in accordance with Div. 01 - General Requirements.
  - .2 Operation and maintenance manual (O&M) to be approved by, and final copies deposited with, Engineer before final inspection.
  - .3 For all equipment listed in O&M manuals provide a schedule detailing the supplied component, name, address & phone no. of equipment vendor, parts supplier and warranty agent.
  - .4 Operation data to include:
    - .1 Control schematics for each system including environmental controls.
    - .2 Description of each system and its controls.
    - .3 Description of operation of each system at various loads together with reset schedules and seasonal variances.

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- 1.7 Closeout Submittals (Cont'd)
- .4 Operation data to include:(Cont'd)
    - .4 Operation instruction for each system and each component.
    - .5 Description of actions to be taken in event of equipment failure.
    - .6 Valves schedule and flow diagram.
  - .5 Maintenance data shall include:
    - .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
    - .2 Data to include schedules of tasks, frequency, tools required and task time.
  - .6 Performance data to include:
    - .1 Equipment manufacturer's performance data sheets with point of operation as left after commissioning is complete.
    - .2 Equipment performance verification test results.
    - .3 Special performance data as specified elsewhere.
    - .4 Testing, adjusting and balancing reports as specified in Section 23 05 93 - Testing, Adjusting and Balancing.
  - .7 Approvals:
    - .1 Submit electronic format (pdf) copy of draft Operation and Maintenance Manual to Engineer for approval. Submission of individual data will not be accepted unless so directed by Engineer.
    - .2 Make changes as required and re-submit as directed by Engineer.
    - .3 Upon acceptance by Engineer submit one (1) electronic format (pdf) and three (3) hardcopies of O&M manuals to Owner.
  - .8 Additional data:
    - .1 Prepare and insert additional data into operation and maintenance manual when the need becomes apparent during demonstrations and instructions specified above.
- 1.8 Acceptable Products
- .1 Design is based on first manufacturer's name under acceptable products. Subsequent manufacturer's names indicate that those named are acceptable providing they meet specifications and space limitations and are subject to acceptance by Shop Drawing Review.
- 1.9 Shop Drawings and Product Data
- .1 Submit single electronic (pdf) copy of shop drawings and product data along with transmittal, in accordance with Div. 01 - General Requirements. Hard copy shop drawings shall not be accepted.
  - .2 Shop drawings and product data shall show:
    - .1 Mounting arrangements.
    - .2 Operating and maintenance clearances. eg. access door swing spaces.
  - .3 Shop drawings and product data shall be accompanied by:
    - .1 Detailed drawings of bases, supports, and anchor bolts.
    - .2 Acoustical sound power data, where applicable.
    - .3 Points of operation on full equipment performance curves.
    - .4 Manufacturer to certify as to current model production.
    - .5 Certification of compliance to applicable codes.



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- 1.9 Shop Drawings and Product Data (Cont'd) .4 The information to be indicated on manufacturers' shop drawings submitted for review shall include the following:
- .1 General arrangement drawings showing component parts. Where the equipment proposed, or a component part thereof, includes modifications to a manufacturers' standard to meet the requirements of a specification, a complete assembly drawing must be submitted.
  - .2 Overall dimensions, roughing-in dimensions and clearance dimensions of all major components.
  - .3 Mounting details and dimensions.
  - .4 Complete certified performance data for the specified application with particular reference to rate of flow, operating pressure and temperatures, entering and leaving conditions of air or fluid, operating weights, operating limitation, electrical characteristics and BHP requirements.
  - .5 Gauge of fabricated material and finish specification.
  - .6 Vibration isolators and resilient hangers stating locations and weight distribution.
  - .7 Electrical wiring diagrams, control panel boards, motor test data, motor starters and controls for electrically-operated equipment furnished by mechanical trades.
- .5 Review of shop drawings or detail drawings will not relieve the obligation of ensuring that the equipment, materials, or layouts meet the functional requirements of the specifications, and that all necessary mounting space and clearance requirements are met. Thus, the Engineer's review is for assistance only.
- .6 No equipment will be accepted on the job site without shop drawings having been reviewed by the Engineer.
- 1.10 Cleaning .1 Prior to turnover to client, clean interior and exterior of all new systems. Replace all air & hydronic filters on new & modified systems. Vacuum interior of new and modified ductwork and air handling units.
- 1.11 As-built Drawings .1 Site records:
- .1 Mechanical sub-contractor shall mark all changes as work progresses and as changes occur.
  - .2 On a weekly basis, transfer information to record set of documents, revising to show all work as actually installed.
  - .3 Use different colour waterproof ink for each service.
  - .4 Make available for reference purposes and inspection at all times.
- .2 As-built drawings:
- .1 Prior to start of Testing, Adjusting and Balancing (TAB), finalize production of as-built drawings.
  - .2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (date).
- .3 Submit copies of as-built drawings for inclusion in final TAB report.

- 1.12 Fees and Permits .1 Pay all fees and obtain all permits, taxes relating to the mechanical scope of work.
- 1.13 Warranty .1 Unless indicated otherwise provide one (1) year warranty starting at substantial completion for all new systems including materials, equipment & labour.
- 1.14 Location of Mechanical Equipment .1 Allow for 1500 mm of adjustment for exact location of air handling units, pumps, ducts, piping, etc. at no extra cost or credit.
- 1.15 Electronic Drawings .1 Goodkey, Weedmark & Associates Limited will agree to supply the mechanical drawings in the form of electronic documents for the project to the User for the convenience of the User in carrying out it's work. The User shall sign a License Agreement before drawings will be released.
- 1.16 Cutting, Patching & Coring .1 Provide cutting, patching and coring of all walls, ceiling & concrete slabs and other surfaces as required for mechanical work. Check with Owner or Building Management prior to core drilling and cutting of structure regarding building requirements and policies. Provide notification, clearance & protection.
- .2 The following procedure shall be followed for cutting & core drilling:
- .1 Contractor to coordinate and summarize all new cores and openings in building structure. Contractor to investigate on site and locate any existing available hole which may be re-used for new systems.
  - .2 Contractor to prepare a layout sketch showing all existing openings & holes and required new openings & holes, with size and locations to the closest grid line in both directions, and submit for review and approval by the architect & structural engineer.
  - .3 Structural engineer to provide written report outlining acceptance of the openings, as well as specific requirements for reinforcing at each location.
  - .4 Contractor to proceed with reinforcing tracing as per report and scanning for electrical conduit. Scanning to be completed using ground penetrating Radar (GPR) technology.
  - .5 Contractor shall identify at each location prior to coring and cutting the location, direction and layer of each reinforcing bar and conduit.
  - .6 Any core or opening where reinforcing steel was cut during the cutting & coring process must be retained on site, and the Contractor must inform the engineer with the following information: size of the reinforcing bar, reinforcing layer location (top steel or bottom slab steel) and direction of the bar (east - west or north - south).
- .3 Patch and make good surfaces cut, damaged or disturbed, to Engineer's approval. Match existing material, colour, finish and texture or as indicated otherwise.
- .4 Provide dust tight screens or partitions to localize dust generating activities and for protection of finished areas of work, workers and public.

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- 1.17 Final  
Inspection
- .1 Do not request final inspection until:
    - .1 Deficiencies are less than 2 items.
    - .2 All systems have been tested and are ready for operation.
    - .3 All air & water balancing has been completed as applicable.
    - .4 The Owner's operating personnel have been instructed in the operation of all systems and equipment.
    - .5 The complete operation and maintenance data books have been delivered to the Engineer.
    - .6 All record drawings have been completed and approved.
    - .7 The cleaning up is finished in all respects.
    - .8 Upon completion of above, contractor to request in writing for final site review with a minimal 72 hour notification.
  - .2 Final installation shall be subject to the approval of the Engineer.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 American Society of Mechanical Engineers (ASME)  
.1 ASME B16.15-2011, Cast Bronze Threaded Fittings, Classes 125 and 250.  
.2 ASME B16.18-2012, Cast Copper Alloy Solder Joint Pressure Fittings.  
.3 ASME B16.22-2012, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.  
.4 ASME B16.24-2011, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150 and 300.
- .2 American Society for Testing and Materials (ASTM)  
.1 ASTM A307-12, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.  
.2 ASTM B88M-05(2011), Specification for Seamless Copper Water Tube (Metric).
- .3 American Water Works Association (AWWA)  
.1 AWWA C111/A21.11-12, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- .4 Canadian Standards Association (CSA)  
.1 CSA B242-05(R2011), Groove- and Shoulder-Type Mechanical Pipe Couplings.
- 1.3 Product Data .1 Submit product data in accordance with Section 21 05 01 - Mechanical General Requirements.

**PART 2 - PRODUCTS**

- 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 ASME B16.24.  
.2 Cast bronze threaded fittings, Class 125 and 250: to ASME B16.15.  
.3 Cast copper, solder type: to ASME B16.18.  
.4 Wrought copper and copper alloy, solder type: to ASME B16.22.  
.5 NPS 2 and larger: roll grooved to CSA B242.

- 2.3 Joints .1 Rubber gaskets, 1.6 mm thick: to AWWA C111/A21.11.
- .2 Bolts, nuts, hex head and washers: to ASTM A307, heavy series.
- .3 Solder: 95/5 lead free solder. No lead content in excess of 0.2%.
- .4 Teflon tape: for threaded joints.
- .5 Dielectric connections between dissimilar metals: dielectric fitting to ASTM F492, complete with thermoplastic liner. Bronze or brass ball valves are an acceptable dielectric fitting where applicable.

- 2.4 Valves .1 Refer to Section 23 05 23 - Valves.

### **PART 3 - EXECUTION**

- 3.1 Installation .1 Install in accordance with Canadian Plumbing Code, Provincial Plumbing Code and local authority having jurisdiction.
- .2 Cut square, ream and clean tubing and tube ends, clean recesses of fittings and assemble without binding.
- .3 Assemble piping using fittings manufactured to ANSI standards.
- .4 Install DCW piping below and away from DHW and DHWR and other hot piping so as to maintain temperature of cold water as low as possible.
- .5 Connect to fixtures and equipment in accordance with manufacturer's written instructions unless otherwise indicated.

- 3.2 Pressure Tests .1 Test pressure: greater of 1½ times maximum system operating pressure or 860 kPa.

- 3.3 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 to verify that system is clean. Let system flush for additional 2 h, then draw off another sample for testing. Submit test results to Engineer.

- 3.4 Pre-Start-up Inspections .1 Systems to be complete, prior to flushing, testing and start-up.
- .2 Verify that system can be completely drained.
- .3 Ensure that pressure booster systems are operating properly.
- .4 Ensure that air chambers, expansion compensators are installed properly.

- 3.5 Disinfection .1 Flush out, disinfect and rinse system to requirements of authority having jurisdiction and to the approval of Engineer.
- .2 Upon completion, provide laboratory test reports on water quality for Engineer approval.
- 3.6 Start-up .1 Timing: Start up after:
- .1 Pressure tests have been completed.
- .2 Disinfection procedures have been completed.
- .3 Certificate of static completion has been issued.
- .2 Provide continuous supervision during start-up.
- .3 Start-up procedures:
- .1 Establish circulation and ensure that air is eliminated.
- .2 Check pressurization to ensure proper operation and to prevent water hammer, flashing and/or cavitation.
- .3 Monitor DHW and DHWR piping systems for freedom of movement, pipe expansion as designed.
- .4 Check control, limit, safety devices for normal and safe operation.
- .4 Rectify start-up deficiencies.
- 3.7 Performance Verification .1 Timing:
- .1 After pressure and leakage tests and disinfection completed, and certificate of completion has been issued by authority having jurisdiction.
- .2 Procedures:
- .1 Verify compliance with safety and health requirements.
- .2 Check for proper operation of water hammer arrestors. Run 10% of outlets for 10 seconds, then shut off water immediately. If water hammer occurs, replace water hammer arrestor or re-charge air chambers. Repeat for outlets and flush valves.
- .3 Confirm water quality consistent with supply standards, verifying that no residuals remain as a result of flushing and/or cleaning.

- END OF SECTION -

## **PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 American Society for Testing and Materials (ASTM)  
.1 ASTM D2564-12, Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.  
.2 Canadian Standards Association (CSA)  
.1 CSA B1800-11, Thermoplastic Nonpressure Piping Compendium (Consists of B181.0, B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.7, B182.8 and B182.11).  
.3 Underwriters Laboratories of Canada (ULC)  
.1 CAN/ULC S102.2-10, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.  
.2 CAN/ULC S115-11, Standard Method of Fire Tests of Firestop Systems.

## **PART 2 - PRODUCTS**

- 2.1 Piping and Fittings .1 DWV PVC (Polyvinyl Chloride):  
.1 Application: below grade sanitary, storm & vent piping & fittings and above grade where combustible piping is permitted.  
.2 Pipe and Fittings: Drain, waste and vent pipe and fittings shall be certified to CSA B181.2. When combustible pipe and fittings are used in buildings required to be of noncombustible construction, they shall be listed by ULC to the Standard CAN/ULC S102.2 and clearly marked with the certification logo indicating a flame-spread rating not exceeding 25.  
.2 Fire & smoke resistant coated DWV PVC (Polyvinyl Chloride) piping & fittings:  
.1 Application: Above grade sanitary, storm & vent piping & fittings where combustible fire & smoke resistant piping is required.  
.2 Pipe and Fittings: Drain, waste and vent pipe and fittings shall be certified to CSA B181.2 and when used in noncombustible construction, high-rise buildings and air plenums, they shall be tested and listed in accordance with CAN/ULC S102.2 and clearly marked with the certification logo indicating a flame-spread rating not exceeding 25 and a smoke-developed classification not exceeding 50.  
.3 Firestopping Devices:  
.1 All combustible pipe penetrations shall comply with the requirements described in the O.B.C. 3.1.9.4.(1) through (8) and provide a firestop system that has been Tested and Listed to the test Standard CAN/ULC S115 with a pressure differential of 50 Pa. In addition, the manufacturer shall provide a documentation confirming compliance with the Listed system.  
.4 Solvent Welding:  
.1 Solvent cements shall be CSA certified and meet the requirements of ASTM D2564. One-step cement may be used for sizes from NPS 40 to 150. Two-step

- 2.1 Piping and Fittings (Cont'd)
- .4 Solvent Welding:(Cont'd)
    - .1 (Cont'd)  
cement must be used in conjunction with primer on larger pipe sizes. Proper solvent cementing procedures must be followed at all times.
    - .2 The manufacturer, shall be consulted prior to installation for proper solvent welding procedures and proper solvent cement requirements.
  - .5 Expansion/Contraction:
    - .1 Compensation shall be made to accommodate expansion/contraction on the drainage system. It is recommended that there be compensation on every second floor for the vertical piping system. Consult pipe system manufacturer for specific details regarding approved compensation methods.
  - .6 Compatibility:
    - .1 To ensure compatibility, performance and material quality, all pipe and fitting drainage system shall be produced by the same manufacturer.
  - .7 Quality Control:
    - .1 The manufacturer of the pipe and fitting system shall be contacted prior to the installation to obtain precise installation instructions. Site meetings shall be arranged and include, the Contractor, Manufacturer and Building Inspector.

### **PART 3 - EXECUTION**

- 3.1 Installation
- .1 Install in accordance with Canadian Plumbing Code, Provincial Plumbing Code and local authority having jurisdiction.
- 3.2 Testing
- .1 Test in accordance with OBC Part 7 requirements.
  - .2 Pressure test buried systems before backfilling.
  - .3 Hydraulically test to verify grades and freedom from obstructions.
- 3.3 Performance Verification
- .1 Cleanouts:
    - .1 Ensure accessible and that access doors are correctly located.
    - .2 Open, cover with linseed oil and re-seal.
    - .3 Verify cleanout rods can probe as far as the next cleanout, at least.
  - .2 Test to ensure traps are fully and permanently primed.
  - .3 Ensure that fixtures are properly anchored, connected to system and effectively vented.
  - .4 Affix applicable label (storm, sanitary, vent, pump discharge etc.) c/w directional arrows every floor or 4.5 m (whichever is less).

- END OF SECTION -



**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 Plumbing and Drainage Institute (PDI)  
.1 PDI-WH201-92, Water Hammer Arresters Standard.
- 1.3 Submittals .1 Submit shop drawings and product data in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 For shop drawings, indicate dimensions, construction details and materials.  
.3 For product data, indicate dimensions, construction details and materials for items specified herein.
- 1.4 Closeout Submittals .1 Provide maintenance data for incorporation into manual specified in Section 21 05 01 - Mechanical General Requirements.  
.2 Data to include:  
.1 Description of plumbing specialties and accessories, giving manufacturers name, type, model, year and capacity.  
.2 Details of operation, servicing and maintenance.  
.3 Recommended spare parts list.

**PART 2 - PRODUCTS**

- 2.1 Cleanouts .1 Cleanout plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket.  
.2 Access covers:  
.1 Wall access: face or wall type, polished nickel bronze square cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.  
.2 Floor access: round cast iron body and frame with adjustable secured nickel bronze top and:  
.1 Plugs: bolted bronze with neoprene gasket.  
.2 Cover for unfinished concrete floors: nickel bronze round, gasket, vandal-proof screws.  
.3 Cover for terrazzo finish: polished nickel bronze with recessed cover for filling with terrazzo, vandal-proof locking screws.  
.4 Cover for tile and linoleum floors: polished nickel bronze with recessed cover for linoleum or tile infill, complete with vandal-proof locking screws.  
.5 Cover for carpeted floors: polished nickel bronze with deep flange cover for carpet infill, complete with carpet retainer vandal-proof locking screws.

2.2 Water Hammer Arrestors .1 Copper construction, bellows or piston type: to PDI-WH201.

**PART 3 - EXECUTION**

3.1 Installation .1 Install in accordance with Canadian Plumbing Code, provincial codes, and local authority having jurisdiction.  
.2 Install in accordance with manufacturer's instructions and as specified.

3.2 Cleanouts .1 In addition to those required by code, and as indicated, install at base of soil and waste stacks, and rainwater leaders.  
.2 Bring cleanouts to wall or finished floor unless serviceable from below floor.  
.3 Building drain cleanout and stack base cleanouts: line size to maximum NPS4.

3.3 Water Hammer Arrestors .1 Install on branch supplies to fixtures or group of fixtures.

3.4 Testing and Adjusting .1 Access doors:  
.1 Verify size and location relative to items to be accessed.  
.2 Cleanouts:  
.1 Verify covers are gas-tight, secure, yet readily removeable.  
.3 Water hammer arrestors:  
.1 Verify proper installation of correct type of water hammer arrester.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 Canadian Standards Association (CSA)  
.1 CAN/CSA B45 Series-02 (R2013), Plumbing Fixtures (Consists of B45.0-02, B45.1-02, B45.2-02, B45.3-02, B45.4-02, B45.5-02, B45.6-02, B45.7-02, B45.8-02 and B45.9-02), Includes Updates No. 1, No. 2, No. 3, and No. 4 (2007).  
.2 CSA B125-01, Plumbing Fittings.  
.3 CSA B651-12, Accessible Design for the Built Environment.
- 1.3 Shop Drawings .1 Submit shop drawings and product data in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Indicate, for all fixtures and trim:  
.1 Dimensions, construction details, roughing-in dimensions.  
.2 Factory-set water consumption per flush at recommended pressure.  
.3 (For water closets, urinals): minimum pressure required for flushing.
- 1.4 Closeout Submittals .1 Provide maintenance data including monitoring requirements for incorporation into manuals specified in Section 21 05 01 - Mechanical General Requirements.  
.2 Include:  
.1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.  
.2 Details of operation, servicing, maintenance.  
.3 List of recommended spare parts.

**PART 2 - PRODUCTS**

- 2.1 Manufactured Units .1 Fixture piping.  
.1 Hot and cold water supplies to each fixture:  
.1 Stops supplies shall be all brass with full turn brass seems and replaceable washer attachment shall be IPS inlet x compression OD outlet to fixture. All fixture stop valves shall be screw driver type.  
.2 Chrome plated in all exposed places.  
.2 Waste:  
.1 Cast brass adjustable style P-trap with cleanout on each fixture not having integral trap.  
.2 Chrome plated in all exposed places.  
.3 Sink and lavatory heavy gauge P-traps shall be cast brass adjustable style with 17 ga. seamless brass wall bend. Attachment nuts shall be brass, no zinc allowed.

- 2.1 Manufactured Units (Cont'd) .1 (Cont'd)
- .2 Waste:(Cont'd)
  - .4 Lavatory strainers shall be chrome plated cast brass with 17 ga. seamless brass tailpiece.
  - .5 All barrier-free lavatories and sinks shall have chrome plated offset tail piece in addition to P-trap with cleanout. Insulate P-trap and hot & cold water pipes with pre-formed & finished surface insulation. Armaflex insulation and tape not acceptable.
- .2 Fixtures:
- .1 Manufacture in accordance with CSA B45.
  - .2 All products, where applicable, shall be marked with manufacturer's name or product #.
- .3 Trim, fittings: manufacture in accordance with CSA B125.
- .4 Number, locations: Architectural drawings to govern.
- .5 Fixtures in any one location to be product of one manufacturer and of same type.
- .6 Trim in any one location to be product of one manufacturer and of same type unless otherwise indicated.
- .7 Reference drawing schedule for configuration and type.
- 2.2 Carriers .1 Provide for all wall mounted plumbing fixtures.
- 2.3 Fixture Traps .1 Brass P-traps complete with cleanouts on all fixtures which do not have built-in traps. Chrome plated in all exposed places.
- 2.4 Roughing-in of Fixtures .1 Rough-in for equipment supplied by other to be complete with valved supplies, wastes and vents, capped and associated fitting piping & reducers.
- 2.5 Plumbing Fixtures .1 Reference fixture schedule on Drawings.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Mounting heights:
- .1 Standard: to comply with manufacturer's recommendations unless otherwise indicated or specified.
  - .2 Wall-hung fixtures: as indicated, measured from finished floor.
  - .3 Physically handicapped: to comply with most stringent of either NBCC, OBC or CAN/CSA B651.
- 3.2 Urinals .1 Urinal waste pipe & fittings shall be DWV PVC equivalent to IPEX System 15 in accordance with specification Section 22 13 18 - Drainage Waste and Vent - Plastic. Extend plastic piping up to combined waste from adjacent lavatory or other plumbing fixtures allowing dilution of waste.
- 3.3 Adjusting .1 Conform to water conservation requirements specified this section.
- .2 Adjustments:
- .1 Adjust water flow rate to design flow rates and sensors.
  - .2 Adjust pressure to fixtures to ensure no splashing at maximum pressures.
  - .3 Adjust flush valves to suit actual site conditions.
- .3 Checks:
- .1 Water closets: flushing action.
  - .2 Aerators: operation, cleanliness.
  - .3 Vacuum breakers, backflow preventers: operation under all conditions.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 American Society for Testing and Materials (ASTM).  
.1 ASTM B16/B16M-10, Standard Specification for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines.  
.2 ASTM B62-09, Specification for Composition Bronze or Ounce Metal Castings.
- 1.3 Product Data .1 Submit product data in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Submit data for all valves specified in this section.
- 1.4 Closeout Submittals .1 Submit maintenance data for incorporation into manual specified in Section 21 05 01 - Mechanical General Requirements.
- 1.5 Acceptable Manufacturers .1 Refer to Acceptable Products Table in Part 3 of this section.

**PART 2 - PRODUCTS**

- 2.1 General .1 All valves of the same type to be from one manufacturer.  
.2 All valves to have CRN registration numbers.
- 2.2 Ball Valves .1 NPS 4 and under:  
.1 Body and cap: cast high tensile bronze to ASTM B62 or brass to ASTM B16/B16M C36000.  
.2 Stem: tamperproof ball drive.  
.3 Stem packing nut: external to body.  
.4 Ball and seat: replaceable chrome plated brass solid full port ball and teflon seats.  
.5 Stem seal: TFE with external packing nut.  
.6 Operator: removable lever handle.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Remove internal parts before soldering or brazing.
- .2 Install all valves such that adequate clearance is provided to allow for obstruction free operation.
- .3 Install valves at all branch take-offs and to isolate each piece of equipment, and as indicated.
- .4 For all threaded valves provide one screwed union beside each valve to allow easy replacement of valve.
- .5 Install all valves as per manufacturer's recommendation.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 American Society of Mechanical Engineers (ANSI/ASME)  
.1 ASME B31.1-2012, Power Piping, (SI Edition).  
.2 American Society for Testing and Materials (ASTM)  
.1 ASTM A125-96(2007), Specification for Steel Springs, Helical, Heat-Treated.  
.2 ASTM A307-12, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.  
.3 ASTM A563-07a, Specification for Carbon and Alloy Steel Nuts (Metric).  
.3 Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS)  
.1 MSS SP-58-2009, Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation.
- 1.3 Design Requirements .1 Construct pipe hanger and support to manufacturer's recommendations utilizing manufacturer's regular production components, parts and assemblies.  
.2 Base maximum load ratings on allowable stresses prescribed by ASME B31.1 or MSS SP-58.  
.3 Ensure that supports, guides, anchors do not transmit excessive quantities of heat to building structure.  
.4 Design hangers and supports to support systems under all conditions of operation, allow free expansion and contraction, prevent excessive stresses from being introduced into pipework or connected equipment.  
.5 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment to be in accordance with MSS SP-58.
- 1.4 Shop Drawings and Product Data .1 Submit shop drawings and product data in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Submit shop drawings and product data for following items:  
.1 All bases, hangers and supports.  
.2 Connections to equipment & structure.  
.3 Structural assemblies.



- 1.5 Closeout .1 Provide maintenance data for incorporation into manual specified in Section 21 05 01 -  
Submittals Mechanical General Requirements.

## **PART 2 - PRODUCTS**

- 2.1 General .1 Fabricate hangers, supports and sway braces in accordance with ANSI B31.1 and MSS SP-58.
- .2 Use components for intended design purpose only. Do not use for rigging or erection purposes.
- 2.2 Pipe Hangers .1 Finishes: Ensure steel hangers in contact with copper piping are copper plated or epoxy coated.
- .2 Upper attachment structural: Suspension from lower flange of I-Beam.
- .1 Cold piping NPS 2 maximum: Malleable iron C-clamp with hardened steel cup point setscrew, locknut and carbon steel retaining clip.
- .1 Rod: 9 mm UL listed.
- .2 Cold piping NPS 2½ or greater, all hot piping: Malleable iron beam clamp, eye rod, jaws and extension with carbon steel retaining clip, tie rod, nuts and washers, UL listed to MSS SP-58.
- .3 Upper attachment structural: Suspension from upper flange of I-Beam.
- .1 Cold piping NPS 2 maximum: Ductile iron top-of-beam C-clamp with hardened steel cup point setscrew, locknut and carbon steel retaining clip, UL listed to MSS SP-58.
- .2 Cold piping NPS 2½ or greater, all hot piping: Malleable iron top-of-beam jaw-clamp with hooked rod, spring washer, plain washer and nut UL listed.
- .4 Upper attachment to concrete.
- .1 Ceiling: Carbon steel welded rod, clevis plate, clevis pin and cotters with weldless forged steel nut.
- .2 Concrete inserts: wedge shaped body with knockout protector plate UL listed to MSS SP-58.
- .5 Manufacturer assemblies:
- .1 Sway braces for seismic restraint systems: to Section 23 05 49.01 - Seismic Restraint Systems (SRS) - Type P2 Buildings.
- .6 Hanger rods: threaded rod material to MSS SP-58.
- .1 Ensure that hanger rods are subject to tensile loading only.
- .2 Provide linkages where lateral or axial movement of pipework is anticipated.
- .3 Do not use 22 mm or 28 mm rod.
- .7 Pipe attachments: material to MSS SP-58.
- .1 Attachments for steel piping: carbon steel black.
- .2 Attachments for copper piping: copper plated black steel.
- .3 Use insulation shields for hot pipework.
- .4 Oversize pipe hangers and supports.

- 2.2 Pipe Hangers (Cont'd)
- .8 Adjustable clevis: material to MSS SP-58 UL listed, clevis bolt with nipple spacer and vertical adjustment nuts above and below clevis. Ensure "U" has hole in bottom for rivetting to insulation shields.
  - .9 Yoke style pipe roll: carbon steel yoke, rod and nuts with cast iron roll, to MSS SP-58.
  - .10 U-bolts: carbon steel to MSS SP-58 with 2 nuts at each end to ASTM A563.
    - .1 Finishes for steel pipework: black.
    - .2 Finishes for copper, glass, brass or aluminum pipework: black, with formed portion epoxy coated.
  - .11 Pipe rollers: cast iron roll and roll stand with carbon steel rod to MSS SP-58, Type 43.
    - .1 Finish: Hot dipped galvanized steel.
    - .2 Acceptable material: Tolco or approved equal.
- 2.3 Riser Clamps
- .1 Steel or cast iron pipe: black carbon steel to MSS SP-58, type 42, UL listed.
  - .2 Copper pipe: carbon steel copper plated to MSS SP-58, type 42.
  - .3 Bolts: to ASTM A307.
  - .4 Nuts: to ASTM A563.
- 2.4 Insulation Protection Shields
- .1 Insulated cold piping: 64 kg/m<sup>3</sup> density insulation plus insulation protection shield to: MSS SP-58, galvanized sheet carbon steel. Length designed for maximum 3 m span.
  - .2 Insulated hot piping: Curved plate 300 mm long, with edges turned up, welded-in centre plate for pipe sizes NPS 12 and over, carbon steel to comply with MSS SP-58.
- 2.5 Constant Support Spring Hangers
- .1 Springs: alloy steel to ASTM A125, shot peened, magnetic particle inspected, with +/-5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with CMTR.
  - .2 Load adjustability: 10% minimum adjustability each side of calibrated load. Adjustment without special tools. Adjustments not to affect travel capabilities.
  - .3 Provide upper and lower factory set travel stops.
  - .4 Provide load adjustment scale for field adjustments.
  - .5 Total travel to be actual travel + 20%. Difference between total travel and actual travel 25 mm minimum.
  - .6 Individually calibrated scales on each side of support calibrated prior to shipment, complete with calibration record.

- 2.6 Variable Support Spring Hangers
- .1 Vertical movement: 13 mm minimum, 50 mm maximum, use single spring pre-compressed variable spring hangers.
  - .2 Vertical movement greater than 50 mm: use double spring pre-compressed variable spring hanger with 2 springs in series in single casing.
  - .3 Variable spring hanger to be complete with factory calibrated travel stops.
  - .4 Steel alloy springs: to ASTM A125, shot peened, magnetic particle inspected, with +/-5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with CMTR.

### **PART 3 - EXECUTION**

- 3.1 Installation
- .1 Install in accordance with: manufacturer's instructions and recommendations.
  - .2 Clamps on riser piping:
    - .1 Support independent of connected horizontal pipework using riser clamps and riser clamp lugs welded to riser.
    - .2 Bolt-tightening torques to be to industry standards.
    - .3 Steel pipes: Install below coupling or shear lugs welded to pipe.
    - .4 Cast iron pipes: Install below joint.
  - .3 Clevis plates:
    - .1 Attach to concrete with 4 minimum concrete inserts, one at each corner.
  - .4 Provide supplementary structural steelwork where structural bearings do not exist or where concrete inserts are not in correct locations.
  - .5 Use approved constant support type hangers where:
    - .1 vertical movement of pipework is 13 mm or more,
    - .2 transfer of load to adjacent hangers or connected equipment is not permitted.
  - .6 Use variable support spring hangers where:
    - .1 transfer of load to adjacent piping or to connected equipment is not critical.
    - .2 variation in supporting effect does not exceed 25% of total load.
  - .7 When attaching to open web steel joists provide additional hangers for pipes with diameters of 75 mm or greater in order to reduce the magnitude of the concentrated load and spread the load to the joists equally. In these cases the allowable spacing of hangers for pipes permitted under ASME / MSS-SP-58 will be reduced and additional hangers will be required as directed by steel fabricator and/or structural engineer.
  - .8 Locate hangers at the top of open web steel joists where the horizontal and diagonal members meet at a joint.
- 3.2 Hanger Spacing
- .1 Plumbing piping: most stringent requirements of Manufacturer's recommendations, Canadian Plumbing Code, Provincial Code, or authority having jurisdiction.
  - .2 Copper piping: up to NPS ½: every 1.5 m.

**Bases, Hangers and Supports**

- 3.2 Hanger Spacing (Cont'd)
- .3 Flexible joint roll groove pipe: in accordance with table below, but not less than one hanger at joints.
  - .4 Within 300 mm of each elbow.

Maximum Pipe Size: NPS	Maximum Spacing Steel	Maximum Spacing Copper
up to 1¼	2.1 m	1.8 m
1½	2.7 m	2.4 m
2	3.0 m	2.7 m
2½	3.6 m	3.0 m
3	3.6 m	3.0 m
3½	3.9 m	3.3 m
4	4.2 m	3.6 m
5	4.8 m	
6	5.1 m	
8	5.7 m	
10	6.6 m	
12	6.9 m	

- .5 Pipework greater than NPS 12: to MSS SP-58.

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

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

- 3.5 Final Adjustment
- .1 Adjust hangers and supports:
    - .1 Ensure that rod is vertical under operating conditions.
    - .2 Equalize loads.
  - .2 Adjustable clevis:
    - .1 Tighten hanger load nut securely to ensure proper hanger performance.
    - .2 Tighten upper nut after adjustment.
  - .3 C-clamps: Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to bottom flange of beam.
  - .4 Beam clamps: Hammer jaw firmly against underside of beam.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 Canadian General Standards Board (CGSB).  
.1 CAN/CGSB-24.3-92, Identification of Piping Systems.  
.2 Canadian Standards Association (CSA).
- 1.3 Product Data .1 Submit product data in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Product data to include paint colour chips, all other products specified in this section.

**PART 2 - PRODUCTS**

- 2.1 Identification of Piping Systems .1 Identify contents by background colour marking, legend; direction of flow by arrows. To CAN/CGSB-24.3 except where specified otherwise.  
.2 Legend:  
.1 Block capitals to sizes and colours listed in CAN/CGSB-24.3.  
.3 Arrows showing direction of flow:  
.1 Continuous wrap full diameter of pipe at each end of pipe identification markers.  
.4 Extent of background colour marking:  
.1 To full circumference of pipe or insulation.  
.2 Length to accommodate full length of legend and arrows.  
.5 Materials for background colour marking, legend, arrows:  
.1 Pipes and tubing 3/4" and smaller: Waterproof and heat-resistant pressure sensitive plastic marker tags.  
.2 All other pipes: Pressure sensitive plastic-coated cloth or vinyl with protective overcoating, waterproof contact adhesive undercoating, suitable for ambient of 100% RH and continuous operating temperature of 300°F and intermittent temperature of 400°F.  
.6 Colours and Legends:  
.1 Where not listed, obtain direction from Engineer.  
.2 Colours for legends, arrows: To following table:  
Background colour: Yellow Legend, arrows: BLACK  
Green WHITE  
Red WHITE

2.1 Identification of Piping Systems (Cont'd)

- .6 Colours and Legends:(Cont'd)
- .3 Background colour marking and legends for piping systems:

Contents	Background colour marking	Legend
Domestic hot water supply	Green	DOM. HW SUPPLY
Dom. HWS recirculation	Green	DOM. HW CIRC
Domestic cold water supply	Green	DOM. CWS
Sanitary	Green	SAN.
Plumbing vent	Green	SAN. VENT

2.2 Identification Ductwork Systems

- .1 50 mm (2") high stencilled letters and directional arrows 150 mm (6") long x 50 mm (2") high.
- .2 Colours: Black, or co-ordinated with base colour to ensure strong contrast.

2.3 Mechanical Equipment, Valves, Controllers, Pumps, Boilers, Fan Coi etc.

- .1 Lamicaid tag with 13 mm (½") stamped identification data filled with black paint.
- .2 Include flow diagrams for each system, of approved size, showing charts and schedules with identification of each tagged item, valve type, service, function, normal position, location of tagged item.
- .3 Brass tags with 13 mm (½") stamped identification data filled with black paint.
- .4 Brass tags to be stamped with system identification and valve number system as outlined below:

SYSTEM	BRASS TAG STAMP
Domestic Cold Water	DC-1,2, ...
Domestic Hot Water	DH-1,2, ...

2.4 Controls Components Identification

- .1 Identify all systems, equipment, components, controls, sensors with system nameplates specified in this section.
- .2 Inscriptions to include function and (where appropriate) fail-safe position.

2.5 Language

- .1 Identification to be in English.

**PART 3 - EXECUTION**

- 3.1 Timing .1 Provide identification only after all painting specified in Architectural section is complete re: Interior Painting has been completed.
- 3.2 Installation .1 Perform work in accordance with CAN/CGSB-24.3 except as specified otherwise.  
.2 Provide ULC and CSA registration plates as required by respective agency.
- 3.3 Nameplates .1 Locations:  
.1 In conspicuous location to facilitate easy reading and identification from operating floor.  
.2 Standoffs:  
.1 Provide for nameplates on hot and/or insulated surfaces.  
.3 Protection  
.1 Do not paint, insulate or cover in any way.
- 3.4 Location of Identification on Piping and Ductwork Systems .1 On long straight runs in open areas in boiler rooms, equipment rooms, galleries, tunnels: At not more than 17 m (55 ft.) intervals and more frequently if required to ensure that at least one is visible from any one viewpoint in operating areas and walking aisles.  
.2 Adjacent to each change in direction.  
.3 At least once in each small room through which piping or ductwork passes.  
.4 On both sides of visual obstruction or where run is difficult to follow.  
.5 On both sides of separations such as walls, floors, partitions.  
.6 Where system is installed in pipe chases, ceiling spaces, galleries, other confined spaces, at entry and exit points, and at each access opening.  
.7 At beginning and end points of each run and at each piece of equipment in run.  
.8 At point immediately upstream of major manually operated or automatically controlled valves, dampers, etc. Where this is not possible, place identification as close as possible, preferably on upstream side.  
.9 Identification to be easily and accurately readable from usual operating areas and from access points.  
.10 Position of identification to be approximately at right angles to most convenient line of sight, considering operating positions, lighting conditions, risk of physical damage or injury and reduced visibility over time due to dust and dirt.  
.11 At branch take-offs on both main and branch.

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

- END OF SECTION -



**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 General .1 TAB means to test, adjust and balance to perform in accordance with requirements of Contract Documents and to do all other work as specified in this section.
- 1.3 Qualifications of TAB Personnel .1 The following are acceptable TAB contractors:  
.1 Aerodynamics & Associates Testing Services Ltd. (N.B.C.T.A., ASHRAE)  
.2 Maxima Technical Services Inc.  
.3 Brassard Adjustments & Calibrations Inc.
- 1.4 Purpose of TAB .1 Test to verify proper and safe operation, determine actual point of performance, evaluate qualitative and quantitative performance of equipment, systems and controls at design, average and low loads using actual or simulated loads  
.2 Adjust and regulate equipment and systems so as to meet specified performance requirements and to achieve specified interaction with all other related systems under all normal and emergency loads and operating conditions.  
.3 Balance systems and equipment to regulate flow rates to match load requirements over full operating ranges.
- 1.5 Exceptions .1 TAB of systems and equipment regulated by codes, standards to be to satisfaction of authority having jurisdiction.
- 1.6 Co-ordination .1 Schedule time required for TAB (including repairs, re-testing) into project construction and completion schedule so as to ensure completion before acceptance of project.  
.2 Do TAB of each system independently and subsequently, where interlocked with other systems, in unison with those systems.  
.3 Coordinate TAB with controls, mechanical and electrical contractors.
- 1.7 Pre-TAB Review .1 Review contract documents before project construction is started and confirm in writing to Engineer adequacy of provisions for TAB and all other aspects of design and installation pertinent to success of TAB.  
.2 Review specified standards and report to Engineer in writing all proposed procedures which vary from standard.

- 1.7 Pre-TAB Review (Cont'd) .3 During construction, co-ordinate location and installation of all TAB devices, equipment, accessories, measurement ports and fittings.
- 1.8 Start-up .1 Follow start-up procedures as recommended by equipment manufacturer unless specified otherwise.
- .2 Follow special start-up procedures specified elsewhere in Divisions 21, 22, 23 & 25.
- 1.9 Operation of Systems During TAB .1 Operate systems for length of time required for TAB and as required by Engineer for verification of TAB reports.
- 1.10 Start of TAB .1 Notify Engineer 7 days prior to start of TAB.
- .2 Start TAB only when building is essentially completed, including:
- .3 Start-up, verification for proper, normal and safe operation of all mechanical and associated electrical and control systems affecting TAB including but not limited to:
- .1 Proper thermal overload protection in place for electrical equipment.
- .2 Air systems:
- .1 Duct systems clean.
- .2 Correct fan rotation.
- .3 Fire, smoke, volume control dampers installed and open.
- .4 Access doors, installed, closed.
- .5 All outlets installed, volume control dampers open.
- 1.11 Application Tolerances .1 Do TAB to following tolerances of design values:
- .1 HVAC systems: plus 5%, minus 5%.
- 1.12 Accuracy Tolerances .1 Measured values to be accurate to within plus or minus 2% of actual values.
- 1.13 Instruments .1 Prior to TAB, submit to Engineer list of instruments to be used together with serial numbers.
- .2 Calibrate in accordance with requirements of most stringent of referenced standard for either applicable system or HVAC system.
- .3 Calibrate within 3 months of TAB. Provide certificate of calibration to Engineer.
- 1.14 TAB Report .1 Format to be in accordance with Associated Air Balancing Council (AABC/CAABC).

- 1.14 TAB Report (Cont'd) .2 TAB report to show all results in SI units or Imperial (IP), to match drawings and specifications, and to include:
- .1 Project record drawings.
  - .2 System schematics.
- .3 Submit pdf electronic copy of TAB Report to Engineer for verification and approval.
- 1.15 Verification .1 All reported results subject to verification by Engineer.
- .2 Provide manpower and instrumentation to verify up to 30% of all reported results.
  - .3 Number and location of verified results to be at discretion of Engineer.
  - .4 Bear costs to repeat TAB as required to satisfaction of Engineer.
- 1.16 Settings .1 After TAB is completed to satisfaction of Engineer, replace drive guards, close all access doors, lock all devices in set positions, ensure sensors are at required settings.
- .2 Permanently mark all settings to allow restoration at any time during life of facility. Markings not to be eradicated or covered in any way.
- 1.17 Completion of TAB .1 TAB to be considered complete only when final TAB Report received and approved by Engineer.
- 1.18 Systems .1 Quality assurance: Perform TAB under direction of supervisor qualified by AABC.
- .2 Air Systems: Include both specified and measured data.
    - .1 Air Handling Equipment:
      - .1 Maximum air flow volume.
      - .2 Fan total pressure.
      - .3 Motor volts, amps and power.
      - .4 Fan rotational speed.
    - .2 Air Outlets:
      - .1 Outlet location and designation.
      - .2 Manufacturers catalogue identification and type.
      - .3 Air outlet flow factors. Use 1.0 when flow hood is used.
      - .4 Air flow volumes.
      - .5 Deflector vane or diffuser cone settings.

**PART 2 - PRODUCTS**

2.1 Not Used .1 Not used.

**PART 3 - EXECUTION**

3.1 Balancing and .1 Perform testing, adjusting and balancing work after equipment and systems starting  
Adjusting procedures have been properly completed.  
Preparation .2 Cap all instrument test ports. Obtain caps from sheet metal contractor and install.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project. Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 American Society for Testing and Materials (ASTM).  
.1 ASTM C335/C335M-10e1, Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation.  
.2 ASTM C449-07, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.  
.2 Canadian General Standards Board (CGSB)  
.1 CAN/CGSB-51.10-92, Mineral Fibre Board Thermal Insulation.  
.2 CGSB 51-GP-52Ma, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.  
.3 Manufacturer's Trade Associations: Thermal Insulation Association of Canada (TIAC): National Insulation Standards.  
.4 Underwriters Laboratories (UL)  
.1 UL 723, Tests for Surface Burning Characteristics of Building Materials.  
.5 Underwriters Laboratories of Canada (ULC)  
.1 CAN/ULC S102-10, Surface Burning Characteristics of Building Materials and Assemblies.
- 1.3 Definitions .1 For purposes of this section:  
.1 "CONCEALED" - insulated mechanical services and equipment in suspended ceilings and non-accessible chases and furred-in spaces.  
.2 "EXPOSED" - will mean "not concealed" as defined herein.  
.3 Insulation systems - insulation material, fasteners, jackets, and other accessories.  
.2 TIAC Codes:  
.1 CRD: Code Round Ductwork,  
.2 CRF: Code Rectangular Finish.
- 1.4 Shop Drawings .1 Submit shop drawings in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Submit for approval manufacturer's catalogue literature related to installation, fabrication for duct jointing recommendations.

- 1.5 Manufacturer's Instructions .1 Submit manufacturer's installation instructions in accordance with Section 21 05 01 - Mechanical General Requirements, if requested by Engineer.
- .2 Installation instructions to include procedures to be used, installation standards to be achieved.
- 1.6 Qualifications .1 Installer to be specialist in performing work of this section, and have at least 5 years successful experience in this size and type of project, qualified to standards.
- 1.7 Delivery, Storage and Handling .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2 Protect from weather and construction traffic.
- .3 Protect against damage from any source.
- .4 Store at temperatures and conditions required by manufacturer.

**PART 2 - PRODUCTS**

- 2.1 Fire and Smoke Rating .1 In accordance with CAN/ULC S102:
- .1 Maximum flame spread rating: 25.
- .2 Maximum smoke developed rating: 50.
- 2.2 Insulation .1 Mineral fibre as specified herein includes glass fibre, rock wool, slag wool.
- .2 Thermal conductivity ("k" factor) not to exceed specified values at 24°C mean temperature when tested in accordance with ASTM C335/C335M.
- .3 TIAC Code C-1: Rigid mineral fibre board to CAN/CGSB-51.10, with factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this Section).
- 2.3 Jackets .1 Acrylic Adhesive:
- .1 Thickness: 0.18 mm.
- .2 Finish: white.
- .3 Peel Adhesion: 18N/25 mm (65 oz./in.)
- .4 Puncture: 130N (30 lbs.).
- .5 UL 723 listed (10/20 flame/smoke rating).
- .6 Acceptable material: VentureClad 1577CW.
- 2.4 Accessories .1 Vapour retarder lap adhesive: Water based, fire retardant type, compatible with insulation.
- .2 Indoor Vapour Retarder Finish: Vinyl emulsion type acrylic, compatible with insulation.

- 2.4 Accessories  
(Cont'd)
- .3 Insulating Cement: hydraulic setting on mineral wool, to ASTM C449.
  - .4 Outdoor Vapour Retarder Mastic:
    - .1 Vinyl emulsion type acrylic, compatible with insulation.
    - .2 Reinforcing fabric: Fibrous glass, untreated 305 g/m<sup>2</sup>.
  - .5 Tape: self-adhesive, aluminum, reinforced, 75 mm (3") wide minimum.
  - .6 Contact adhesive: quick-setting
  - .7 Canvas adhesive: washable.
  - .8 Tie wire: 1.5 mm stainless steel.
  - .9 Banding: 19 mm (3/4") wide, 0.5 mm thick stainless steel.
  - .10 Facing: 25 mm (1") galvanized steel hexagonal wire mesh stitched on one face of insulation.
  - .11 Fasteners: 2 mm diameter pins with 38 mm (1½") diameter clips, length to suit thickness of insulation.

### **PART 3 - EXECUTION**

- 3.1 Pre-  
installation  
Requirements
- .1 Surfaces to be clean, dry, free from foreign material.
- 3.2 Installation
- .1 Install in accordance with TIAC National Standards.
  - .2 Apply materials in accordance with manufacturers instructions and this specification.
  - .3 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
    - .1 Hangers, supports to be outside vapour retarder jacket.
  - .4 Supports, Hangers in accordance with Section 23 05 29 - Bases, Hangers and Supports
    - .1 Apply high compressive strength insulation where insulation may be compressed by weight of ductwork.
  - .5 Fasteners: At 300 mm (12") oc in horizontal and vertical directions, minimum two rows each side.

3.3 Ductwork  
Insulation Schedule

.1 Insulation types and thicknesses: Conform to following table:

<u>Thickness</u>	<u>TIAC</u>	<u>Vapour Code</u>	<u>Retarder mm (in.)</u>
Exhaust ducts within 3 m from roof/ exterior wall penetration	C-1	yes	50 (2")
<u>Acoustically lined ductwork</u>	<u>none</u>		

.2 Exposed round ducts 600 mm and larger, smaller sizes where subject to abuse:

.1 Use TIAC code C-1 insulation, scored to suit diameter of duct.

.3 Finishes:

.1 Indoor exposed: Acrylic adhesive.

- END OF SECTION -



**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 American Society for Testing and Materials (ASTM) (latest edition).  
.1 ASTM C335/C335M-10e1, Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation.  
.2 ASTM C449-07(2013), Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.  
.2 Canadian General Standards Board (CGSB)  
.1 CAN/CGSB-51.9-92 Mineral Fibre Thermal Insulation for Piping and Round Ducting.  
.2 CAN/CGSB-51.12-95, Cement, Thermal Insulating and Finishing.  
.3 CGSB 51-GP-52Ma, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.  
.3 Manufacturer's Trade Associations (latest edition).  
.1 Thermal Insulation Association of Canada (TIAC): National Insulation Standards.  
.4 Underwriters' Laboratories of Canada (ULC)  
.1 CAN/ULC S102-10, Surface Burning Characteristics of Building Materials and Assemblies.
- 1.3 Definitions .1 For purposes of this section:  
.1 "CONCEALED" - insulated mechanical services in suspended ceilings and non-accessible chases and furred-in spaces.  
.2 "EXPOSED" - will mean "not concealed" as defined herein.  
.2 TIAC ss:  
.1 CRF: Code Rectangular Finish.  
.2 CPF: Code Piping Finish.
- 1.4 Shop Drawings .1 Submit shop drawings in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Submit for approval manufacturer's catalogue literature related to installation, fabrication for pipe, fittings, valves and jointing recommendations.
- 1.5 Samples .1 Submit samples in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Submit for approval: complete assembly of each type of insulation system, insulation, coating, and adhesive proposed. Mount sample on 12 mm (½") plywood board. Affix typewritten label beneath sample indicating service.

- 1.6 Manufacturer's Instructions .1 Submit manufacturer's installation instructions in accordance with Section 21 05 01 - Mechanical General Requirements.
- .2 Installation instructions to include procedures to be used, installation standards to be achieved.
- 1.7 Qualifications .1 Installer to be specialist in performing work of this section, and have at least 5 years successful experience in this size and type of project, qualified to standards.
- 1.8 Delivery, Storage and Handling .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2 Protect from weather, construction traffic.
- .3 Protect against damage from any source.
- .4 Store at temperatures and conditions required by manufacturer.

## **PART 2 - PRODUCTS**

- 2.1 Fire and Smoke Rating .1 In accordance with CAN/ULC S102:
- .1 Maximum flame spread rating: 25.
- .2 Maximum smoke developed rating: 50.
- 2.2 Insulation .1 Mineral fibre as specified herein includes glass fibre, rock wool, slag wool.
- .2 Thermal conductivity ("k" factor) not to exceed specified values at 24°C mean temperature when tested in accordance with ASTM C335/C335M.
- .3 TIAC Code A-1: Rigid moulded mineral fibre without factory applied vapour retarder jacket (as scheduled in PART 3 of this section).
- .1 Mineral fibre: to CAN/CGSB-51.9.
- .2 Maximum "k" factor: to CAN/CGSB-51.9.
- .4 TIAC Code A-3: Rigid moulded mineral fibre with factory applied vapour retarder jacket (as scheduled in PART 3 of this section).
- .1 Mineral fibre: to CAN/CGSB-51.9.
- .2 Jacket: to CGSB 51-GP-52Ma.
- .3 Maximum "k" factor: to CAN/CGSB-51.9.
- 2.3 Insulation Securement .1 Tape: Self-adhesive, aluminum, reinforced, 50 mm wide minimum.
- .2 Contact adhesive: Quick setting.
- .3 Canvas adhesive: Washable.

2.3 Insulation Securement <u>(Cont'd)</u>	.4 .5	Tie wire: 1.5 mm diameter stainless steel. Bands: Stainless steel, 19 mm wide, 0.5 mm thick.
2.4 Cement	.1	Thermal insulating and finishing cement: .1 To CAN/CGSB-51.12. .2 Hydraulic setting or Air drying on mineral wool, to ASTM C449.
2.5 Vapour Retarder Lap Adhesive	.1	Water based, fire retardant type, compatible with insulation.
2.6 Indoor Vapour Retarder Finish	.1	Vinyl emulsion type acrylic, compatible with insulation.
2.7 Jackets	.1	PVC: .1 Ontario Building Code compliant for 25/50 flame spread and smoke developed. .2 Minimum thickness 0.015 mil. .3 Colour white unless otherwise specified. .4 Non yellowing UV stabilized. .5 Minimum service temperatures: -20°C. .6 Maximum service temperature: 65°C. .7 Moisture vapour transmission: 0.02 perm. .8 Fastenings: .1 Use solvent weld adhesive compatible with insulation to seal laps and joints. .2 Tacks. .3 Pressure sensitive vinyl tape of matching colour.

### **PART 3 - EXECUTION**

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

**Thermal Insulation for Piping**

- 3.2 Installation (Cont'd)
- .4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
    - .1 Hangers, supports to be outside vapour retarder jacket.
    - .2 Saddles to have ridges to limit movement while in hanger.
    - .3 To be edge flared to prevent cutting/damage to insulation coverage.
  - .5 Supports, Hangers:
    - .1 Apply high compressive strength insulation, suitable for service, at oversized saddles and shoes where insulation saddles have not been provided.
- 3.3 Removable, Pre-fabricated, Insulation and Enclosures
- .1 Application: At expansion joints, valves, primary flow measuring elements flanges and unions at equipment.
  - .2 Design: To permit movement of expansion joint and to permit periodic removal and replacement without damage to adjacent insulation.
  - .3 Insulation:
    - .1 Insulation, fastenings and finishes: same as system.
    - .2 Jacket: PVC.
- 3.4 Installation of Elastomeric Insulation
- .1 Insulation to remain dry at all times. Overlaps to manufacturers instructions. Ensure tight joints.
  - .2 Provide vapour retarder as recommended by manufacturer.
- 3.5 Piping Insulation Schedules
- .1 Includes valves, valve bonnets, strainers, flanges and fittings unless otherwise specified.
  - .2 TIAC Code: A-1.
    - .1 Securements: Tape at 300 mm oc.
    - .2 Seals: lap seal adhesive, lagging adhesive.
    - .3 Installation: TIAC Code 1501-H.
  - .3 TIAC Code: A-3.
    - .1 Securements: Tape at 300 mm oc.
    - .2 Seals: VR lap seal adhesive, VR lagging adhesive.
    - .3 Installation: TIAC Code: 1501-C.
  - .4 Thickness of insulation to be as listed in following table.
 

Application	Temp °C	TIAC code	Pipe sizes (NPS) and insulation thickness (mm)			
			1/2 to 2	2-1/2 to 4	5 to 6	8 & over
Domestic Hot Water		A-1	25	38	38	38
Domestic Cold Water		A-3	25	25	25	25
  - .5 Finishes:
    - .1 Exposed indoors: PVC.
    - .2 Concealed, indoors: PVC on valves and fittings only. No further finish.
    - .3 Use vapour retarder jacket on TIAC code A-3 insulation compatible with insulation.

- 3.5 Piping  
Insulation  
Schedules  
(Cont'd)
- .5 Finishes:(Cont'd)  
.4 Finish attachments: Stainless steel bands at 150 mm oc. Seals: wing or closed.  
.5 Installation: To appropriate TIAC code CRF/1 through CPF/5.
- .6 Domestic hot, cold and recirc piping shall be completely thermally insulated to fixtures, except exposed supply assembly at fixtures.

- END OF SECTION -

## **PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 Shop Drawings .1 Submit shop drawings and product data in accordance with Section 21 05 01 - Mechanical General Requirements.
- 1.3 Closeout Submittals .1 Provide maintenance data including monitoring requirements for incorporation into manuals specified in Section 21 05 01 - Mechanical General Requirements.

## **PART 2 - PRODUCTS**

- 2.1 Valves .1 Valve operators: spring return for "fail safe" in normally open position.
- .2 Water valves:  
.1 Two-way: single seated, equal percentage, quick opening characteristics, as indicated.
- .3 Steam valves:  
.1 Modified linear characteristics, with stainless steel seat for dead end service.
- 2.2 Thermostat .1 Pneumatic directing acting type to match base building thermostats.
- 2.3 Identification .1 Provide in accordance with Section 23 05 53.01 - Mechanical Identification.
- 2.4 Control Air Tubing .1 Plastic: flame retardant PVC tubing with minimum burst gauge pressure of 1.4 MPa at 80 degrees C.
- .2 Copper: type L complete with flared fittings.

**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 datasheet.
- 3.2 Installation .1 Identify and code pneumatic tubing at every branch and at each piece of equipment and components.
- .2 Use copper tubing with flared fittings in following locations:
- .1 Inaccessible areas.
  - .2 Where single lines travel from tube tray to instruments.
  - .3 Areas of heat above 80 degrees C.
  - .4 Mechanical rooms.
  - .5 Rooms where piping subject to damage.
  - .6 Adjacent to heating pipes passing through common sleeve.
  - .7 Where air pressures above 200 kPa.
  - .8 Where codes will not permit use of PVC.
  - .9 In fire rated walls and ceilings.
- .3 Follow building lines. Do not cover with insulation. Install drip legs and drains at low points.
- 3.3 Field Quality Control .1 Start-Up and Adjustment:
- .1 Upon completion of installation, test, adjust and regulate controls or safety equipment provided under this Section.
  - .2 Adjust and place in operating condition.
- 3.4 Cleaning .1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 SMACNA HVAC Duct Construction Standards, Metal and Flexible, 1985.  
.2 SMACNA HVAC Duct Leakage Test Manual, 1985.  
.3 Canadian Standards Association (CSA)  
.1 CSA B228.1-1968, Pipe, Ducts and Fittings for Residential Type Air Conditioning Systems.  
.4 American Society for Testing and Materials (ASTM)  
.1 ASTM A924/A924M-13, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.  
.5 National Fire Protection Association (NFPA)  
.1 NFPA (Fire) 90A, Installation of Air Conditioning and Ventilating Systems, 2012 Edition.  
.2 NFPA (Fire) 90B, Installation of Warm Air Heating and Air Conditioning Systems, 2012 Edition.
- 1.3 Shop Drawings and Product Data .1 Submit shop drawings and product data in accordance with Section 21 05 01 - Mechanical General Requirements.  
.2 Indicate following:  
.1 Sealants  
.2 Tape  
.3 Proprietary Joints
- 1.4 Certification of Ratings .1 Catalogue or published ratings shall be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.



**PART 2 - PRODUCTS**

- 2.1 Seal Classification .1 Classification as follows:
- | Maximum System Total Pressure Pa | SMACNA Seal Class |
|----------------------------------|-------------------|
| 500                              | B                 |
| 250                              | B                 |
| 125                              | B                 |
- .2 Seal classification:  
.1 Class B: longitudinal seams, transverse joints and connections made airtight with sealant.
- .3 Application:  
.1 All new & existing supply ductwork.  
.2 All new return & exhaust ductwork.
- 2.2 Sealant .1 Sealant: oil resistant, polymer type flame resistant duct sealant. Temperature range of minus 22°F to plus 200°F.
- 2.3 Duct Leakage .1 In accordance with SMACNA HVAC Duct Leakage Test Manual.
- 2.4 Fittings .1 Fabrication: to SMACNA.
- .2 Radiused elbows:  
.1 Rectangular: standard radius: 1.5 times width of duct.  
.2 Round: 1.5 times diameter.
- .3 Mitred elbows, rectangular:  
.1 To 400 mm (16"): with single thickness turning vanes.  
.2 Over 400 mm (16"): with double thickness turning vanes.
- .4 Branches:  
.1 Rectangular main and branch: with 45° entry on branch.  
.2 Round main and branch: enter main duct at 45° with conical connection.  
.3 Provide volume control damper in branch duct near connection to main duct.  
.4 Main duct branches: with splitter damper.
- .5 Transitions:  
.1 Diverging: 20° maximum included angle.  
.2 Converging: 30° maximum included angle.
- .6 Offsets:  
.1 Full radiused elbows.

- 2.4 Fittings (Cont'd) .7 Obstruction deflectors: maintain full cross-sectional area. Maximum included angles: as for transitions.
- 2.5 Firestopping .1 Retaining angles all around duct, on both sides of fire separation.  
 .2 Firestopping material and installation must not distort duct.
- 2.6 Galvanized Steel .1 Lock forming quality: to ASTM A924/A924M, Z90 zinc coating.  
 .2 Thickness, fabrication and reinforcement: to SMACNA.  
 .3 Joints: to SMACNA.
- 2.7 Escutcheon Angles .1 40 mm x 40 mm angle iron frame on both sides of exposed rectangular or round ducts, on both sides of non-rated partitions. Escutcheon angles material & gauge shall be equal to base material.
- 2.8 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 (20").  
 .2 Hanger configuration: to SMACNA.  
 .3 Hangers: black steel angle with black steel rods to SMACNA and following table:
- | Duct Size<br>(in.) | Angle Size<br>(in.) | Rod Size<br>(in.) |
|--------------------|---------------------|-------------------|
| up to 30           | 1 x 1 x 1/8         | 1/4               |
| 31 to 42           | 1½ x 1½ x 1/8       | 1/4               |
| 43 to 60           | 1½ x 1½ x 1/8       | 2/5               |
| 61 to 84           | 2 x 2 x 1/8         | 2/5               |
| 85 to 96           | 2 x 2 x 1/5         | 2/5               |
| 97 and over        | 2 x 2 x 1/4         | 2/5               |
- .4 Upper hanger attachments:  
 .1 For concrete: manufactured concrete inserts.  
 .2 For steel joist: manufactured joist clamp or steel plate washer.  
 .3 For steel beams: manufactured beam clamps.

**PART 3 - EXECUTION**

- 3.1 General .1 Do work in accordance with NFPA (Fire) 90A, NFPA (Fire) 90B, CSA B228.1 and SMACNA.
- .2 Do not break continuity of insulation vapour barrier with hangers or rods. Insulate strap hangers 100 mm (4") beyond insulated duct.
- .3 Support risers in accordance with ASHRAE and SMACNA.
- .4 Install breakaway joints in ductwork on each side of fire separation.
- .5 Install proprietary manufactured flanged duct joints in accordance with manufacturer's instructions.
- .6 Manufacture duct in lengths to accommodate installation of acoustic duct lining.
- .7 Install escutcheon sheet metal angles on both sides of exposed rectangular or round ducts on both sides of non-rated partitions. Seal void with acoustic sealant.

- 3.2 Hangers .1 Strap hangers: install in accordance with SMACNA.
- .2 Angle hangers: complete with locking nuts and washers.
- .3 Hanger spacing: in accordance with SMACNA as follows:

Duct Size mm (in.)	Spacing m (ft.)
to 1500 (60)	3 (10)
1525 (61) and over	2.5 (8)

- 3.3 Sealing and Taping .1 Apply sealant to outside of joint to manufacturer's recommendations.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 Canadian Standards Association (CSA)  
.1 CSA B228.1-1968, Pipes, Ducts and Fittings for Residential Type Air Conditioning.
- 1.3 Product Data .1 Submit product data in accordance with Section 23 05 01 - Mechanical General Requirements.  
.2 Indicate the following:  
.1 Flexible connections.  
.2 Duct access doors.  
.3 Instrument test ports.
- 1.4 Certification of Ratings .1 Catalogue or published ratings shall be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.

**PART 2 - PRODUCTS**

- 2.1 General .1 Manufacture in accordance with CSA B228.1.
- 2.2 Flexible Connections .1 Frame: galvanized sheet metal frame 0.6 mm thick with fabric clenched by means of double locked seams.  
.2 Material:  
.1 Fire resistant, self extinguishing, neoprene coated glass fabric, temperature rated at minus 40°C to plus 90°C, density of 1.3 kg/m<sup>2</sup>.
- 2.3 Instrument Test Ports .1 1.6 mm thick steel zinc plated after manufacture.  
.2 Cam lock handles with neoprene expansion plug and handle chain.  
.3 28 mm minimum inside diameter. Length to suit insulation thickness.  
.4 Neoprene mounting gasket.

- 2.4 Spin-in Collars .1 Conical galvanized sheet metal spin-in collars with lockable butterfly damper.  
.2 Sheet metal thickness to co-responding round duct standards.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Flexible connections:  
.1 Install in following locations:  
.1 Inlets and outlets to supply air units and fans.  
.2 Inlets and outlets of exhaust and return air fans.  
.3 As indicated.  
.2 Length of connection: 100 mm.  
.3 Minimum distance between metal parts when system in operation: 75 mm.  
.4 Install in accordance with recommendations of SMACNA.  
.5 When fan is running:  
.1 Ducting on each side of flexible connection to be in alignment.  
.2 Ensure slack material in flexible connection.  
.2 Instrument test ports.  
.1 General:  
.1 Install in accordance with recommendations of SMACNA and in accordance with manufacturer's instructions.  
.2 Locate to permit easy manipulation of instruments.  
.3 Install insulation port extensions as required.  
.4 Locations.  
.1 For traverse readings:  
.1 At ducted inlets to roof and wall exhausters.  
.2 At inlets and outlets of other fan systems.  
.3 At main and sub-main ducts.  
.4 And as indicated.  
.2 For temperature readings:  
.1 At outside air intakes.  
.2 In mixed air applications in locations as approved by Engineer.  
.3 At inlet and outlet of coils.  
.4 Downstream of junctions of two converging air streams of different temperatures.  
.5 And as indicated.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 21 05 01 - Mechanical General Requirements, all mechanical sections, and all other disciplines related to the project.
- 1.2 References .1 Air Movement and Control Association (AMCA)  
.1 AMCA 99-10, Standards Handbook.  
.2 AMCA 210-07, Laboratory Methods of Testing Fans for Rating.  
.3 AMCA 300-08, Reverberant Room Method for Sound Testing of Fans.  
.4 AMCA 301-06, Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- .2 American Bearing Manufacturers Association (ABMA)  
.1 ABMA 9:1990 (R2008), Load Ratings and Fatigue Life for Ball Bearings.  
.2 ABMA 11:1990 (R2008), Load Ratings and Fatigue Life for Roller Bearings.
- .3 ASHRAE/Air Movement and Control Association  
.1 ASHRAE/AMCA 51-2007, Laboratory Methods of Testing Fans for Rating.  
.2 ANSI/ASHRAE/IESNA 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings.
- 1.3 Shop Drawings and Product Data .1 Submit shop drawings and product data in accordance with Section 21 05 01 - Mechanical General Requirements.
- .2 Provide:  
.1 Fan performance curves showing point of operation, kW (BHP) and efficiency.  
.2 Sound rating data at point of operation.
- 1.4 Operation and Maintenance Data .1 Provide operation and maintenance data for incorporation into manual specified in Section 21 05 01 - Mechanical General Requirements.
- .2 Furnish list of individual manufacturer's recommended spare parts for equipment such as bearings and seals, and addresses of suppliers, together with list of specialized tools necessary for adjusting, repairing or replacing, for placement into operating manual.
- 1.5 Maintenance Materials .1 Provide maintenance materials in accordance with Section 21 05 01 - Mechanical General Requirements.
- 1.6 Certification of Ratings .1 Catalogued or published ratings shall be those obtained from tests carried out by manufacturer or those ordered from independent testing agency signifying adherence to codes and standards in force.
- .2 Provide confirmation of testing.

**PART 2 - PRODUCTS**

- 2.1 Fans General .1 Capacity: flow rate, total static pressure, bhp, efficiency, revolutions per minute, power, model, size, sound power data and as indicated on schedule.
- .2 Statically and dynamically balanced. Constructed in conformity with AMCA 99.
- .3 Sound ratings: comply with AMCA 301, tested to AMCA 300. Unit shall bear AMCA certified sound rating seal.
- .4 Performance ratings: based on tests performed in accordance with AMCA 210, and ASHRAE/AMCA 51, unit to bear AMCA certified rating seal.
- .5 Performance ratings: based on tests performed in accordance with AMCA 210, and ASHRAE/AMCA 51. Unit shall bear AMCA certified rating seal, except for propeller fans smaller than 300 mm diameter.
- .6 Bearings: sealed lifetime oilite ball bearings heavy duty grease lubricated ball or roller bearings of self aligning type with oil retaining, dust excluding seals and a certified minimum rated life of 200,000 h in accordance with ABMA L50 life standard. Bearings to be rated and selected in accordance with ABMA 9 and ABMA 11.
- .7 Motors:  
.1 In accordance with ANSI/ASHRAE/IESNA 90.1.
- .8 Factory primed before assembly in colour standard to manufacturer.
- .9 Scroll casing drains: as indicated.
- .10 Bearing lubrication systems plus extension lubrication tubes where bearings are not easily accessible.
- .11 Flexible connections: to Section 23 33 00 - Duct Accessories.
- 2.2 Cabinet Fans Direct Drive .1 Fan shall have true centrifugal wheel (or wheels).
- .2 Fans shall have acoustically insulated housings c/w eggcrate type inlet grille and shall have air deliveries and Sone levels as indicated. All fans shall bear the AMCA Certified Ratings Seal and the UL label. Manufacturer shall submit vibration amplitudes and magnetic motor hum levels in decibels.
- .3 Integral backdraft damper shall be totally chatter-proof with no metal to metal contact.
- .4 Entire fan, motor, and wheel assembly shall be easily removable without disturbing the housing. Motor speeds shall not exceed 1500 RPM and all fan motors shall be c/w motor overload, suitably grounded, and mounted on rubber-in-shear vibration isolators.
- .5 Fans shall be equipped with CSA motor rated disconnect switches.
- .6 Supply variable speed controller and turn over to Div. 26 for installation and wiring where indicated.
- .7 Performance: as indicated on drawing schedule.

**PART 3 - EXECUTION**

3.1 Installation .1 Install in accordance with manufacturer's instructions.

- END OF SECTION -



- 1.1 General
- .1 Inspection authorities shall mean Electrical Safety Authority.
  - .2 Supply authority shall mean Hydro Ottawa.
  - .3 Provide shall mean supply, install, test and commission.
  - .4 Refer to General Instructions, Contract Requirements, Amendments and Divisions 00 & 01 and be governed by same.
- 1.2 Codes and Standards
- .1 Provide complete installation in accordance with the latest edition of the Ontario Electrical Safety Code and Electrical Bulletins.
  - .2 Provide overhead and underground systems in accordance with CAN/CSA C22.3 No. 1 except where specified otherwise.
  - .3 Comply with the following additional codes as a minimum:
    - .1 CSA Standards.
    - .2 ULC Standards.
    - .3 National Building Code - Latest Edition.
    - .4 Fire Code.
    - .5 NFPA.
- 1.3 Care, Operation and Start-up
- .1 Instruct operating personnel in the operation, care and maintenance of equipment.
- 1.4 Time of Completion
- .1 Commence work upon notification of acceptance of offer, or as outlined in the approved construction schedule.
  - .2 Verify equipment delivery times immediately and notify engineer within two (2) weeks of contract award of any deliveries which would affect schedule.
- 1.5 Shop Drawings
- .1 Submit single electronic format (pdf) of shop drawings and product data along with transmittal. Hard copy shop drawings shall not be accepted.
  - .2 The review is for the sole purpose of ascertaining conformance with the general design concept, and does not mean approval of the design details inherent in the shop drawings, responsibility for which shall remain with the Contractor. Such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents.
  - .3 Do not commence manufacture or order materials before shop drawings are reviewed.
  - .4 Shop drawings shall clearly indicate:
    - .1 Name of Contractor.
    - .2 Name of component.
    - .3 Name of service or system.
    - .4 Contractors signed review stamp.

- 1.5 Shop Drawings (Cont'd)
- .5 Shop drawings shall include, but is not limited to, the following information:
    - .1 Arrangement of specific system.
    - .2 Electrical characteristics, volts, phase, amps, etc.
    - .3 Dimensions of equipment and required clearances.
    - .4 Performance data.
    - .5 Finish.
    - .6 Gauge of materials.
    - .7 Wiring diagrams (where applicable).
    - .8 Product data (where applicable).
  - .6 Review relevant shop drawings of other Divisions to ensure interface of systems with respect to wiring, voltages, ampacities, phases, size, controls, etc. Notify Engineer of any discrepancies immediately.
  - .7 Provide shop drawings for the equipment listed below and/or as indicated in this specification:
    - .1 Distribution equipment.
    - .2 Light fixtures.
    - .3 Emergency lighting.
    - .4 Motor control equipment.
    - .5 Fire alarm.
- 1.6 Fire & Safety Requirements
- .1 Comply with National Building Code (Part 8, Health and Safety Measures at Construction and Demolition Sites) and Provincial Regulations for Construction Projects.
- 1.7 Existing Services
- .1 Existing services required for work may be used by the Contractor with the Owners written consent. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility.
  - .2 Notify the Owner a minimum of 72 hours in advance of intended interruption of services; obtain requisite permissions.
  - .3 Keep duration of these interruptions to a minimum. Carry out all interruptions after normal working hours of the occupants, preferably on weekends or as approved by the Owner in writing.
  - .4 Any unscheduled disruption to services to be immediately reinstated.
  - .5 Existing fire alarm and security systems are to remain fully functional, throughout, provide conduit and wire as required to maintain services during construction.
- 1.8 Demolition
- .1 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site, and disposed of in accordance with all applicable codes, standards and regulations.
  - .2 Existing lighting ballasts may contain P.C.B.'s. Contact the local Ministry of Environment (M.O.E.) office for confirmation of ballasts containing P.C.B. material. Submit written confirmation from M.O.E. verifying the presence or non-presence of P.C.B.'s. If P.C.B.'s are found to be present, provide removal of ballasts from light fixtures and place in approved 45 gallon drums for storage on site. Handle P.C.B. contaminated equipment in accordance with codes, standards and guidelines.

- 1.8 Demolition (Cont'd)
- .3 Disconnect and make safe all systems to be demolished by other Divisions. Refer to other Divisions for extent.
  - .4 Maintain existing remaining circuits, systems, etc., which pass through construction/demolition areas. Provide additional wire and conduit as required to maintain systems. Additional wire and conduit to be concealed when construction is complete.
  - .5 Reinstate immediately, any existing remaining systems, inadvertently interrupted during construction or demolition.
  - .6 Remove all redundant wiring and conduit in ceiling spaces, (power, communications, systems, etc.).
- 1.9 Protection
- .1 Protect access areas through existing building (lobby, elevator, corridor stairwell, etc.) from damage. Clean area daily or more frequently if directed by Engineer.
  - .2 Protect exterior areas (roof, walls, etc.) against damage during handling of new and removed materials.
  - .3 Repair and make good all damaged equipment, etc. to satisfaction of the Engineer.
  - .4 Protect stored materials, work in process and finished work against damage until take-over.
  - .5 Protect adjacent areas against spread of dust and dirt beyond work areas.
  - .6 Protect operatives and other users of site from all hazards.
- 1.10 Powder Actuated Fastening Devices
- .1 Do not use powder actuated tools using explosives, unless permitted expressly by the Engineer and if so, comply with requirement of CAN3-Z166.2 (Use and Handling of Powder Actuated Tools).
- 1.11 Use of Site and Facilities
- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Building Owner to facilitate work as stated.
  - .2 Particular attention shall be given to minimizing dust, noise and other forms of contamination from occupied areas.
  - .3 Maintain existing services to building and provide for personnel and vehicle access.
  - .4 Where security is reduced by work, provide temporary means to maintain security.
- 1.12 Cutting, Patching & Making Good
- .1 Provide cutting & patching of existing surfaces as required to accommodate new work.
  - .2 Remove all items so shown or specified.
  - .3 Patch and make good surfaces cut, damaged or disturbed, to Engineer's approval. Match existing material, colour, finish and texture or as indicated otherwise.

- 1.12 Cutting, Patching & Making Good  
(Cont'd) .4 Provide dust tight screens or partitions to localize dust generating activities and for protection of finished areas of work, workers and public.
- .5 Scan slabs before coring or drilling deeper than 1" (25 mm). Provide all required notification, clearance & protection for scanning process. Adjust coring & drilling locations as necessary to avoid rebar & conduits.
- 1.13 Examination .1 Examine site and conditions which will affect the work. Submission of tender shall be deemed as confirmation that tenderer has inspected site and is conversant with conditions, and shall not constitute additional costs as a result of site conditions.
- .2 Verify existing conditions including but not limited to, structural elements, sprinkler piping and heads, roof drains and storm sewer piping, electrical conduit and wiring, process utility piping, ductwork and other building services.
- .3 The fact that not all existing conditions discussed in Item .2 above are shown on the drawings does not relieve the responsibility of coordinating the work with the existing construction.
- 1.14 Co-ordination .1 Co-ordinate the work with all other Divisions, especially Divisions 21, 22 & 23, to ensure systems compatibility, and to ensure schedules and requirements are maintained.
- .2 Where perceived interferences occur, prepare detailed sketches indicating proposed solution for review and acceptance by Engineer.
- 1.15 Operating and Maintenance Instructions Manual .1 Submit electronic format (pdf) copy of draft Operation and Maintenance Manual to Engineer for approval, compiled as follows:
- .1 Enclose title sheet labelled "Operating and Maintenance Instructions", project name, date and list of contents. Project name must appear on binder face and spine.
- .2 Organize contents into applicable sections of work to parallel project specifications breakdown. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.
- .2 Include following information plus data specified.
- .1 Installation and maintenance instructions for equipment and materials.
- .2 Description: Operation of the equipment and systems defining start-up, shut-down and emergency procedures, and any fixed or adjustable set points that affects the equipment operation. Include nameplate information such as make, size, capacity and serial number.
- .3 Maintenance: Use clear drawings, diagrams or manufacturers' literature which specifically apply and detail the following:
- .1 Lubrication products and schedules.
- .2 Trouble-shooting procedures.
- .3 Adjustment techniques.
- .4 Operational checks. Suppliers names, addresses and telephone numbers and components supplied by them must be included in this section. Components must be identified by a description and manufacturer's part number.

- 1.15 Operating and Maintenance Instructions Manual (Cont'd)
- .3 Spare Parts: List all recommended spares to be maintained on site to ensure optimum efficiency. List all special tools appropriate unique application. All parts/tools detailed must be identified as to manufacturer, manufacturer part number and supplier (including address).
  - .4 Include shop drawings, operation and maintenance instructions (bound as one) in accordance with the above for all equipment specified.
  - .5 Include one complete set of final shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.
  - .6 Within four (4) weeks of acceptance of draft manuals, submit four (4) copies.
  - .7 Failure to submit manuals as specified, will incur additional 10% holdback against progress payments.
  - .8 Include appropriate wiring diagrams, schematics, elevations, mounting requirements, options included, etc. as it pertains to each system and/or device.
  - .9 Information in manuals is to be specific to this project. Generic information is unacceptable.
- 1.16 As-built Drawings
- .1 Site records:
    - .1 Electrical sub-contractor shall mark all changes as work progresses and as changes occur.
    - .2 On a weekly basis, transfer information to record set of documents, revising to show all work as actually installed.
    - .3 Use different colour waterproof ink for each service.
    - .4 Make available for reference purposes and inspection at all times.
  - .2 As-built drawings:
    - .1 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW ELECTRICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (date).
    - .2 Submit hard copy to Engineer for approval and make corrections as directed.
    - .3 Following approval, submit completed hard copy as-built drawings with Operating and Maintenance Manuals.
- 1.17 Guarantees and Warranties
- .1 Before completion of work, collect all manufacturer's guarantees and warranties and submit to the Engineer.
  - .2 Identify, bind and index material in maintenance manuals.
  - .3 Division 26's Contractor to submit a written, signed guarantee stating that all systems and components have been installed to manufacturers recommendations and that systems are operating satisfactorily and meet the design requirements, and all material and labour deficiencies will be corrected, at no cost, for a period of one year after substantial completion.

- 1.18 Final Inspection .1 Do not request final inspection until:
- .1 Deficiencies are less than 25 items.
  - .2 All systems have been tested and are ready for operation.
  - .3 All balancing of loads has been completed.
  - .4 The Owner's operating personnel have been instructed in the operation of all systems and equipment.
  - .5 The complete operation and maintenance data books have been delivered to the Engineer.
  - .6 All inspection certificates have been furnished.
  - .7 All record drawings have been completed and approved.
  - .8 All spare parts and replacement parts have been provided and receipt of same acknowledged.
  - .9 The cleaning up is finished in all respects.
  - .10 Fire alarm verification certificates submitted.
- .2 Final inspection shall be subjected to the approval of the Engineer.
- 1.19 Clean Up .1 Clean up work area as work progresses.
- .2 At the end of each work period, and more often if ordered by the Engineer, remove debris from site.
  - .3 Clean areas under contract to a condition at least equal to that previously existing and to approval of Engineer.
  - .4 Provide cleaning of light fixture reflectors, lamps and lenses, vacuum panelboards, cabinets switchgear, etc., upon completion of contract, to Engineers satisfaction.
- 1.20 Approval of Alternative Materials .1 During the tendering period, alternative materials to those specified may be considered if full descriptive data are submitted five (5) days prior to tender closing to:
- GOODKEY, WEEDMARK & ASSOCIATES LIMITED  
1688 Woodward Drive  
Ottawa, Ontario  
K2C 3R8
- .2 Approval of alternatives will be signified by issue of an Addendum to the Contract Documents.
  - .3 Include cost of any and all additional work and modifications to the engineering design, and costs incurred by other Divisions as a result of using materials.
- 1.21 Contract Documents .1 Drawings and specifications are complementary, items shown or mentioned in one and not in the other are deemed to be included in the contract work.
- .2 The contract documents are intended to describe complete fully functional systems although not all components are indicated. Division 26 shall provide all required conduits, wiring, equipment, etc. to provide fully functional systems which meet the design intent.

- 1.21 Contract Documents (Cont'd) .3 Discrepancies in the design documents, or doubt as to the full intent of the design shall be brought to the Engineer's attention prior to tender close. Failure to do this means that the Contractor is fully aware and shall be responsible of design intent and requirements and shall provide fully functional and coordinated systems.
- 1.22 Project Schedule .1 On award of contract and upon Engineer's request, submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion.
- .2 All building operations must be maintained during all phases of construction.
- .3 All plant shutdowns causing interruption of services to the building occupants will be scheduled for unoccupied hours (nights or weekends) as approved by the Owner and Engineer. Provide minimum of 72 hours notice.
- .4 When schedule has been reviewed by the Owner and Engineer, take necessary measures to complete work within scheduled time. Any change of schedule must be authorized by Owner and the Engineer.
- 1.23 Cost Breakdown .1 Within one (1) week of award of contract, submit breakdown of costs as separate amounts of labour, materials, etc. of each system. Break down electrical systems generally as follows:
- .1 Start-up.
- .2 Permits and inspections.
- .3 Distribution.
- .4 Branch circuit roughing.
- .5 Wiring devices.
- .6 Lighting:
- .1 Interior.
- .2 Exit Lights.
- .7 Fire alarm.
- .8 Motor control.
- .9 Testing, commissioning and job cleanup. (Generally 1.5 to 3% of total cost). Indicate material & labour costs separately for each item.
- .2 After acceptance by Engineer, cost breakdown will be used as the basis of progress payments.
- 1.24 Permits, Fees and Inspection .1 Submit to Electrical Inspection Department and Supply Authority necessary number of drawings and specifications for examination and approval prior to commencement of work.
- .2 Pay associated fees.
- .3 Notify Engineer of changes required by Electrical Inspection Department prior to making changes.
- .4 Furnish Certificates of Acceptance from Electrical Inspection Department and authorities having jurisdiction on completion of work to Engineer and include in manuals. Final payment will not be made until certificates have been submitted.

**Electrical General Requirements**

- 1.25 Materials and Equipment .1 Equipment and material to be new CSA certified. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from Electrical Inspection Department.
- .2 Factory assemble control panels and component assemblies.
- 1.26 Trade Qualifications .1 The work shall be carried out by licensed electricians with minimum five years experience who hold Ontario Certificates of Qualifications, and current contractors license.
- .2 Installation methods and materials to be of strictest quality, and conform to Canadian General Standards Board, Canadian Standards Association and all Local and Provincial Codes and Standards. Discrepancy in Codes to mean strictest rule applies.
- .3 The ratio of Journeymen to Apprentices shall not exceed the ratio in the Trade Qualifications and Apprenticeship Act.
- 1.27 Finishes .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.
- .2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.
- 1.28 Equipment Identification .1 Identify electrical equipment with nameplates as follows:
- .1 Nameplates:
- .1 Lamicoid 3 mm thick plastic engraving sheet, black face, white core, mechanically attached with self tapping screws.
- | NAMEPLATE SIZES |             |         |                    |
|-----------------|-------------|---------|--------------------|
| Size 2          | 12 x 70 mm  | 1 line  | 5 mm high letters  |
| Size 3          | 12 x 70 mm  | 2 lines | 3 mm high letters  |
| Size 4          | 20 x 90 mm  | 1 line  | 8 mm high letters  |
| Size 5          | 20 x 90 mm  | 2 lines | 5 mm high letters  |
| Size 6          | 25 x 100 mm | 1 line  | 12 mm high letters |
| Size 7          | 25 x 100 mm | 2 lines | 6 mm high letters  |
- .2 Labels:
- .1 Electronically printed, self-adhesive plastic labels with 6 mm high letters unless specified otherwise.
- .3 Wording on nameplates to be as indicated c/w volts, phase, amps, HP, etc.
- .4 Allow for average of twenty-five (25) letters per nameplate.
- .5 Identification to be English and French.
- .6 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .7 Disconnects, starters and contactors: indicate equipment being controlled and voltage, Size 3.
- .8 Terminal cabinets and pull boxes: indicate system and voltage, Size 3.
- .9 Provide typed circuit directory for each panelboard.
- .10 Identify all receptacle outlets by panel, circuit number and voltage, with Brother P-Touch labeller.
- .11 Provide system, circuit, voltage, phase, etc., on all ceiling space junction box covers, red for fire alarm & emergency circuits, black for others.



- 1.29 Wiring Identification .1 Identify wiring with permanent indelible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Colour code: to CSA C22.1.
- 1.30 Conduit and Cable Identification .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.
- |                 | <u>Prime</u> | <u>Auxiliary</u> |
|-----------------|--------------|------------------|
| up to 250 V     | blue         |                  |
| up to 600 V     | yellow       |                  |
| Fire alarm      | red          |                  |
| Emergency power | red          |                  |
- 1.31 Wiring Terminations .1 Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors.
- 1.32 Manufacturers and CSA Labels .1 Visible and legible after equipment is installed.
- 1.33 Location of Outlets .1 Locate outlets as indicated.
- .2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
- .3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.
- .4 Locate light switches on latch side of doors. Locate disconnect devices in mechanical and elevator machine rooms on latch side of door.
- 1.34 Mounting Heights .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at following heights unless indicated otherwise.
- .1 Local switches: 1200 mm.

**Electrical General Requirements**

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- 1.34 Mounting Heights (Cont'd) .3 (Cont'd)
- .2 Wall receptacles:
    - .1 General: 400 mm.
    - .2 Above top of counters or counter back splashes: 175 mm.
    - .3 In mechanical rooms: 1200 mm.
  - .3 'F' indicates floor mounting.
  - .4 'C' indicates ceiling mounted.
  - .5 Fire alarm bells: 2100 mm.
  - .6 Thermostats: 1200 mm.
- 1.35 Conduit and Cable Installation .1 Provide all required accessories, inserts, hangers, toggle bolts, support channels, anchors etc. as required to complete systems.
- 1.36 Field Quality Control .1 Conduct and pay for following tests:
- .1 Systems: fire alarm system.
  - .2 Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions.
  - .3 Insulation resistance testing.
    - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
  - .4 Carry out tests in presence of Engineer.
  - .5 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
  - .6 Submit test results for Engineer's review.
- 1.37 Fire and Smoke Stopping .1 Provide fire and smoke stopping where conduits, etc., penetrate floor slabs or fire rated walls with an approved ULC listed putty, equal to 3M caulk CP25 and putty 303.
- .2 Installation of fire stops by trained manufacturers representative.
- 1.38 Access Doors .1 Provide access doors as required by inspection authorities and Engineer to ensure access to concealed electrical work.
- .2 Access doors shall be as specified in Division 09 with fire resistance rating equal to wall or ceiling in which door to be installed. Minimize access door requirements and obtain approval of locations prior to electrical systems installation. Prepare a sketch drawing indicating locations for review by Owner/Architect/Engineer.
  - .3 Submit access door shop drawings.

- 1.39 Related Work .1 Temporary power - Division 01.  
.2 Painting - Division 09.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 26 05 00 - Electrical General Requirements, all electrical sections, and all other disciplines related to the project.
- 1.2 Shop Drawings .1 Submit cabletrough and busway shop drawings. Indicate mounting details, capacities, connections, etc.
- 1.3 Location of Conduit .1 Drawings do not indicate all conduit runs. Those indicated are in diagrammatic form only.  
.2 Conduit to be concealed.
- 1.4 References .1 Canadian Standards Association (CSA)  
.1 CSA C22.1HB-12, CE Code Handbook, an Explanation of Rules of the Canadian Electrical Code, Part 1.  
.2 CAN/CSA C22.2 No. 65-13, Wire Connectors.

**PART 2 - PRODUCTS**

- 2.1 Conduits .1 Rigid galvanized steel threaded conduit.  
.2 Epoxy coated conduit: with zinc coating and corrosion resistant epoxy finish inside and outside.  
.3 Electrical metallic tubing EMT, with steel set screw couplings and connectors.  
.4 Rigid PVC conduit.  
.5 Flexible steel conduit and liquid-tight flexible metal conduit.
- 2.2 Conduit Fastenings .1 One hole steel straps to secure surface conduits 50 mm and smaller. Two hole steel straps for conduits larger than 50 mm.  
.2 Beam clamps to secure conduits to exposed steel work.  
.3 Channel type supports for two or more conduits at 1.5 m oc.  
.4 Six mm dia threaded rods to support suspended channels.

<u>2.3 Conduit</u>	.1	Fittings: manufactured for use with conduit specified. Coating: same as conduit.
<u>Fittings</u>	.2	Factory "ells" where 90° bends are required for 25 mm and larger conduits.
<u>2.4 Fish Cord</u>	.1	Polypropylene.
<u>2.5 Building Wires</u>	.1	Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG (including ground wires).
	.2	Copper conductors: size as indicated, with 1000 V insulation of chemically cross-linked thermosetting polyethylene material rated RW90. RWU-90 for buried services.
<u>2.6 Fixture Wire</u>	.1	Use type GTF for installation in lighting fixtures.
<u>2.7 Outlet and Conduit Boxes</u>	.1	Size boxes in accordance with CSA C22.2.1HB.
<u>General</u>	.2	100 mm 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	347 V outlet boxes for 347 V switching devices.
	.6	Combination boxes with barriers where outlets for more than one system are grouped.
<u>2.8 Sheet Steel Outlet Boxes</u>	.1	Electro-galvanized steel single and multi gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.
	.2	102 mm square or octagonal outlet boxes for lighting fixture outlets.
	.3	102 mm square outlet boxes with extension and plaster rings for flush mounting devices in finished plaster or tile walls.
<u>2.9 Masonry Boxes</u>	.1	Electro-galvanized steel masonry single and multi gang boxes for devices flush mounted in exposed block walls.
<u>2.10 Concrete Boxes</u>	.1	Electro-galvanized sheet steel concrete type boxes for flush mount in concrete with matching extension and plaster rings as required.

- 2.11 Floor Boxes .1 Concrete tight electro-galvanized sheet steel floor boxes with adjustable finishing rings to suit floor finish with brass faceplate. Device mounting plate to accommodate short or long ear duplex receptacles. Minimum depth: 28 mm for receptacles; 73 mm for communication equipment.
- 2.12 Conduit Boxes .1 Cast FS boxes with factory-threaded hubs and mounting feet for surface wiring of all devices.
- 2.13 Box Fittings-General .1 Bushing and connectors with nylon insulated throats.  
.2 Knock-out fillers to prevent entry of debris.  
.3 Conduit outlet bodies for conduit up to 32 mm and pull boxes for larger conduits.  
.4 Double locknuts and insulated bushings on sheet metal boxes.
- 2.14 Wire and Box Connectors .1 Pressure type wire connectors: with current carrying parts of copper sized to fit copper conductors as required.  
.2 Bushing stud connectors: to EEMAC 1Y-2 to consist of:  
.1 Connector body and stud clamp for stranded copper conductors.  
.3 Clamps or connectors for armoured cable as required.
- 2.15 Support Channels .1 U shape, size 41 x 41 mm, 2.5 mm thick, surface mounted or suspended. Equal to Unistrut, Burndy or Cantruss.

### **PART 3 - EXECUTION**

- 3.1 Installation .1 Conduit Systems  
.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.  
.3 Use rigid galvanized steel threaded conduit in hazardous classified areas and where indicated.  
.4 Use electrical metallic tubing EMT except in where indicated or specified elsewhere.  
.5 Use rigid PVC conduit underground.  
.6 Use liquid tight flexible metal conduit for connection to motors which may vibrate or must be moved for servicing.  
.7 Use liquid tight flexible metal conduit for connection to equipment in damp, wet or corrosive locations.  
.8 Use explosion proof flexible connection for connection to explosion proof motors.  
.9 Install conduit sealing fittings in hazardous areas. Fill with compound.  
.10 Minimum conduit size 21 mm.

**Conduit and Wire**

- 3.1 Installation (Cont'd)
- .1 (Cont'd)
- .11 Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter.
  - .12 Mechanically bend steel conduit over 21 mm dia.
  - .13 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
  - .14 Install fish cord in empty conduits.
  - .15 Run 2-27 mm spare conduits up to ceiling space and 2-27 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 case of an exposed concrete slab, terminate each conduit in surface type box.
  - .16 Where conduits become blocked, remove and replace blocked section. Do not use liquids to clean out conduits.
  - .17 Dry conduits out before installing wire.
  - .18 Run parallel or perpendicular to building lines.
  - .19 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.
  - .20 Run conduits in flanged portion of structural steel.
  - .21 Group conduits wherever possible on channels.
  - .22 Do not pass conduits through structural members except as indicated.
  - .23 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.
  - .24 Do not install horizontal conduits runs in masonry walls.
  - .25 Do not install conduits in terrazzo or concrete toppings.
  - .26 Locate conduits in concrete to suit reinforcing steel. Install in centre one third of slab.
  - .27 Protect conduits from damage where they stub out of concrete.
  - .28 Install sleeves where conduits pass through slab or wall.
  - .29 Do not place conduits in slabs in which slab thickness is less than 4 times conduit diameter.
  - .30 Encase conduits completely in concrete with minimum 25 mm concrete cover.
  - .31 Organize conduits in slab to minimize cross-overs.
  - .32 Slope conduits to provide drainage.
  - .33 Install rigid galvanized steel conduit at roof areas, if exposed.
  - .34 Ream raceways to remove burrs.
  - .35 Provide nylon pull cord in all empty raceways.
- .2 Wiring
- .1 Install RW-90 conductors in raceways except as otherwise indicated.
  - .2 Install MI cables and single conductor cables only as indicated. Provide aluminum plate at supply end of all single conductor runs, and code size ground conductors.
  - .3 Install TECK Cable only as indicated.
  - .4 Installation of type AC-90 will be permitted from:
    - .1 Conduit system junction boxes to recessed lighting fixtures in suspended ceilings, maximum length 2.5 m each run.
    - .2 Conduit system junction boxes to hollow gypsum partitions, maximum length 2.5 m each run.
    - .3 AC-90 is permitted in hollow gypsum partitions.
    - .4 AC-90 is not permitted in insulated masonry walls or concrete walls.
  - .5 Leave minimum 200 mm length of conductor at junction and outlet boxes.
  - .6 Splices shall not be pulled into conduits.
  - .7 Install type RWU-90 conductors in all underground conduit systems.
  - .8 Group AC-90 cables where possible. Do not bundle.
  - .9 Provide approved wire pulling lubricants for cable installations in conduits.
- .3 Outlet boxes
- .1 Support boxes independently of connecting conduits.

**Conduit and Wire**

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- 3.1 Installation (Cont'd) .3 (Cont'd)
- .2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
  - .3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.
  - .4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Reducing washers are not allowed.
  - .5 Provide circuit number identification on all junction boxes with black marker.
- .4 Wire and Box Connections
- .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 CAN/CSA C22.2 No. 65.
    - .2 Install fixture type connectors and tighten. Replace insulating cap.
    - .3 Install bushing stud connectors in accordance with EEMAC 1Y-2.
- .5 Fastenings and Supports
- .1 Secure equipment to hollow masonry, tile and plaster surfaces with lead anchors or nylon shields.
  - .2 Secure equipment to poured concrete with expandable inserts.
  - .3 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. Provide additional supports to T-bar ceiling as required.
  - .4 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
  - .5 Fasten exposed conduit or cables to building construction or support system using straps.
    - .1 One-hole steel straps to secure surface conduits and cables 50 mm and smaller.
    - .2 Two-hole steel straps for conduits and cables larger than 50 mm.
    - .3 Beam clamps to secure conduit to exposed steel work.
  - .6 Suspended support systems.
    - .1 Support individual cable or conduit runs with 6 mm dia threaded rods and spring clips.
    - .2 Support 2 or more cables or conduits on channels supported by 6 mm dia threaded rod hangers where direct fastening to building construction is impractical.
  - .7 For surface mounting of two or more conduits use channels at 1.5 m oc 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.
- .6 Coordinate with manufacturer and install M.I. cabling under direction of manufacturer's representative.

- END OF SECTION -



## **PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 26 05 00 - Electrical General Requirements, all electrical sections, and all other disciplines related to the project.
- 1.2 References .1 Canadian Standards Association (CSA International).

## **PART 2 - PRODUCTS**

- 2.1 Moulded Case Circuit Breakers .1 Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient.
- .2 Common-trip breakers: with single handle for multi-pole applications.
- .3 Circuit breakers with interchangeable trips as indicated.
- .4 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.
- 2.2 Contactors .1 Contactors: to EEMAC No. 1CS.
- .2 Mechanically held controlled by pilot devices as indicated and rated for type of load controlled. Half size contactors not accepted.
- .3 Breaker combination contactor as indicated.
- .4 Complete with 2 normally open and 2 normally closed auxiliary contacts unless indicated otherwise.
- .5 Mount in CSA Enclosure 2 (sprinklerproof) unless otherwise indicated.
- .6 Include following options in cover:
- .1 Red indicating lamp for 'OFF', green for 'ON'.
- .2 Hand-Off-Auto selector switch.
- .7 Control transformer: 600-120V, 50 VA minimum, in contactor enclosure.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Confirm equipment locations and sizes in electrical and mechanical rooms to ensure equipment will fit.
- .2 Secure floor and wall mounted equipment plumb and square.
- .3 Connect supply and load feeders from all equipment.
- .4 Check factory made connections for secureness and electrical continuity.
- .5 Provide auxilliary equipment and connections as required.
- .6 Provide typed, dated panel directory for each affected panelboard on this project.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 26 05 00 - Electrical General Requirements, all electrical sections, and all other disciplines related to the project.
- 1.2 Shop Drawings and Product Data .1 Submit shop drawings and product data in accordance with Section 26 05 00.
- 1.3 Equipment .1 Receptacle and switch devices shall be of a single manufacturer.
- 1.4 References .1 Canadian Standards Association (CSA).

**PART 2 - PRODUCTS**

- 2.1 Switches .1 15 or 20 A, 120 V, or 347 V single pole, double pole, three-way, four-way switches as required.
- .2 Manually-operated general purpose ac switches with following features:
- .1 Silver alloy contacts.
  - .2 Urea or melamine molding for parts subject to carbon tracking.
  - .3 Suitable for back and side wiring.
  - .4 White toggle.
  - .5 Specification Grade.
- 2.2 Receptacles .1 Duplex receptacles, CSA type, voltage, ampacity, phase as indicated, with following features:
- .1 White urea molded housing.
  - .2 Suitable for No. 10 AWG for back and side wiring.
  - .3 Break-off links for use as split receptacles.
  - .4 Eight back wired entrances, four side wiring screws.
  - .5 Triple wipe contacts and rivetted grounding contacts.
  - .6 Ground fault interrupter 5 mA, Class 'A' type where indicated.
  - .7 Surge suppressor type where indicated.
  - .8 Child safety receptacles where indicated.
  - .9 Specification grade.
- 2.3 Cover Plates .1 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.
- .2 Stainless steel, vertically brushed, 1 mm thick cover plates for wiring devices mounted in flush-mounted outlet box.

**Wiring Devices**

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- 2.3 Cover Plates (Cont'd) .3 Cast cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.
- .4 Weatherproof double lift spring-loaded cast aluminum cover plates, complete with gaskets for duplex receptacles as indicated.
- .5 Weatherproof spring-loaded cast aluminum cover plates complete with gaskets for single receptacles or switches.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Switches:
- .1 Install single throw switches with handle in "UP" position when switch closed.
  - .2 Install switches in gang type outlet box when more than one switch is required in one location.
  - .3 Mount toggle switches at height specified in Section 26 05 00 - Electrical General Requirements or as indicated.
- .2 Receptacles:
- .1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.
  - .2 Mount receptacles at height specified in Section 26 05 00 - Electrical General Requirements or as indicated.
  - .3 Where split receptacle has one portion switched, mount vertically and switch upper portion.
- .3 Coverplates:
- .1 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.
  - .2 Install suitable common cover plates where wiring devices are grouped.
  - .3 Do not use coverplates meant for flush outlet boxes on surface-mounted boxes.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 26 05 00 - Electrical General Requirements, all electrical sections, and all other disciplines related to the project.
- 1.2 References .1 Canadian Standards Association (CSA).
- 1.3 Shop Drawings and Product Data .1 Submit shop drawings in accordance with Section 26 05 00.  
.2 Indicate:  
.1 Mounting method and dimensions.  
.2 Starter size and type.  
.3 Layout of identified internal and front panel components.  
.4 Enclosure types.  
.5 Wiring diagram for each type of starter.  
.6 Name of load to be controlled.
- 1.4 Operation and Maintenance Data .1 Provide operation and maintenance data for motor starters for incorporation into manual specified in Section 26 05 00.  
.2 Include operation and maintenance data for each type and style of starter.
- 1.5 Maintenance Materials .1 Provide listed spare parts for each different size and type of starter:  
.1 3 contacts, stationary.  
.2 3 contacts, movable.  
.3 1 contact, auxiliary.  
.4 1 control transformer.  
.5 1 operating coil.  
.6 2 fuses.  
.7 10% indicating lamp bulbs used.
- 1.6 Related Work .1 Refer to shop drawings of other divisions, especially Div. 21, 22, 23 & 25 for exact characteristics of loads to be controlled. Notify Engineer of any changes prior to installation. Ensure starters are suitable for load to be controlled.  
.2 Coordinate with Div. 21, 22, 23 & 25 for control function requirements of the building automation system, and/or monitoring functions. Notify engineer of any discrepancies in requirements.

1.7 Acceptable Manufacturers .1 Motor starters, controls and centres to be of a single manufacturer.

**PART 2 - PRODUCTS**

2.1 Materials .1 Starters: to IEC 947-4 with AC4 utilization category. Half sized starters not acceptable.

2.2 Manual Motor Starters .1 Single or three phase manual motor starters of size, type, rating, and enclosure type as indicated, with components as follows:  
.1 Switching mechanism, quick make and break.  
.2 Overload heaters, manual reset, trip indicating handle.  
.3 CSA certified as a disconnecting means.  
.2 Accessories:  
.1 Toggle or H.O.A. switch heavy duty oil tight labelled as indicated.  
.2 Indicating light: heavy duty oil tight type and colour as indicated.  
.3 Locking tab to permit padlocking in "ON" or "OFF" position.  
.4 Keyed where indicated.  
.3 All starters in common areas to be flush mounted. Surface mount in services 1200 MS.

2.3 Control Transformer .1 Single phase, dry type, control transformer with primary voltage as indicated and 120V secondary, complete with secondary fuse, installed in with starter as indicated.  
.2 Size control transformer for control circuit load plus 20% spare capacity.

2.4 Finishes .1 Apply finishes to enclosure in accordance with Section 26 05 00 - Electrical General Requirements.

2.5 Equipment Identification .1 Provide equipment identification in accordance with Section 26 05 00 - Electrical General Requirements.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Install starters, connect power and control wiring as required.
- .2 Ensure correct fuses and overload devices elements installed.
- 3.2 Field Quality Control .1 Perform tests in accordance with Section 26 05 00 - Electrical General Requirements and manufacturer's instructions.
- .2 Operate switches, contactors to verify correct functioning.
- .3 Perform starting and stopping sequences of contactors and relays.
- .4 Check that sequence controls, interlocking with other separate related starters, equipment, control devices, operate as indicated.
- .5 Submit the following information for each motor controlled, with manuals:
- .1 Motor nameplate date and manufacturer.
- .2 Actual measured full load current.
- .3 Overload device, rating and setting.
- .6 Verify motor rotation prior to acceptance.
- .7 Secure motor control centre rigid and plumb on channel bases, make power and control connections and test individual starters as above.

- END OF SECTION -

## **PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 26 05 00 - Electrical General Requirements, all electrical sections, and all other disciplines related to the project.
- 1.2 Shop Drawings and Product Data .1 Submit shop drawings in accordance with Section 26 05 00.
- 1.3 References .1 American National Standards Institute (ANSI)  
.1 ANSI C62.1, Gapped Silicon- Carbide Surge Arresters for AC Power Circuits.  
.2 ANSI C78.1-1991, American National Standard for Fluorescent Lamps - Rapid-Start Types - Dimensional and Electrical Characteristics.
- .2 Canadian Standards Association (CSA).
- .3 Institute of Electrical and Electronics Engineers (IEEE)  
.1 IEEE 587, Applicability to Adjustable Frequency Control (Surge Voltages).

## **PART 2 - PRODUCTS**

- 2.1 Lamps .1 Incandescent lamps as indicated on fixture list, 5000 hr. life minimum.
- .2 Fluorescent lamps as indicated on fixture list, and as follows:  
.1 32 Watt, T8, 3050 Lumens, 20,000 hr. life. Low mercury content.  
.2 Compact fluorescent lamps, wattage as indicated, 10,000 hr. life low mercury content (Philips Alto or equivalent).  
.3 Color temperature 3500°K or as indicated on Lighting Fixture Schedule or to match existing. Use 3000°K or 4100°K only as indicated or to match existing lamps (3000°K to match warm white, 4100°K to match cool white).  
.4 CRI minimum 85.
- 2.2 Ballasts .1 Fluorescent ballast: CBM and CSA certified, energy efficient type, IC electronic, rapid start:  
.1 Rating: voltage as indicated, for use with 2-32 W lamps, rapid start.  
.2 RFI/EMI suppression circuit.  
.3 Totally encased and designed for 40°C ambient temperature.  
.4 Power factor: minimum 95% with 95% of rated lamp lumens.  
.5 Crest factor: 1.4 maximum current.  
.6 Capacitor: thermally protected.  
.7 Thermal protection: non-resettable on coil.  
.8 Harmonics: 10% maximum THD.  
.9 Operating frequency of electronic ballast: 20 kHz or greater without visible flicker.  
.10 Sound rated: A.  
.11 Mounting: integral with luminaire.



- 2.2 Ballasts (Cont'd) .1 (Cont'd)  
.12 Include line surge withstand to ANSI C62-1 and IEEE 587. Lamp start voltages not to exceed ANSI C78.1.
- 2.3 Finishes .1 Light fixtures to be factory primed and painted after fixture construction.
- 2.4 Fluorescent Fixture Light Control Devices .1 Lens thickness: 3.175 mm minimum.  
.2 Material: injection moulded clear prismatic virgin acrylic.  
.3 Frame: hinged, gasketed, latched, die cast, aluminum.  
.4 Parabolic type louvres as specified in fixture schedule.
- 2.5 Luminaires .1 Provide light fixtures as per fixture schedule, c/w ballasts, lamps and mounting accessories.  
.2 Metal halide fixtures to be supplied c/w integral protective lens.  
.3 Each 347V fluorescent luminaire shall have an integral disconnecting means as per the Canadian Electrical Code.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Locate and install luminaires as indicated.  
.2 Provide sufficient cable length and/or access panels, to provide access to wiring connections in hard ceiling areas, to the inspection authorities requirements.  
.3 Install light fixtures to manufacturers recommendations.  
.4 Connect fixtures to indicated circuits and connect exit lights to emergency battery units.  
.5 Verify and coordinate location of light fixtures on site with other trades to verify clearances at indicated locations prior to installation.
- 3.2 Luminaire Supports .1 For suspended ceiling installations support luminaires independently of ceiling, by means of two chain hangers bolted to fixture and secured to building structure.
- 3.3 Luminaire Alignment .1 Align luminaires mounted individually parallel or perpendicular to building grid lines.

3.4 Testing .1 Verify operation of lighting systems, and controls.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 26 05 00 - Electrical General Requirements, all electrical sections, and all other disciplines related to the project.
- 1.2 Product Data .1 Submit product data in accordance with Section 26 05 00.
- .2 Data to indicate system components, mounting method, source of power and special attachments.
- 1.3 Warranty .1 For batteries, the 12 months warranty period is extended to 120 months, with a no-charge replacement during the first 5 years and a pro-rate charge on the second 5 years.

**PART 2 - PRODUCTS**

- 2.1 Equipment .1 Supply voltage: 347V or 120V, ac.
- .2 Output voltage: 12 V dc.
- .3 Operating time: 30 minute at rated load c/w 10% spare capacity.
- .4 Battery: sealed, maintenance free, long life.
- .5 Charger: solid state, multi-rate, voltage/current regulated, inverse temperature compensated, short circuit protected with regulated output of plus or minus 0.01 V for plus or minus 10% input variations.
- .6 Solid state transfer circuit.
- .7 Low voltage disconnect: solid state, modular, operates at 80% battery output voltage.
- .8 Signal lights: solid state, for 'AC Power ON' and 'High Charge'.
- .9 Lamp heads:
- .1 Integral on unit or remote: 345° horizontal and 180° vertical adjustment, lamp type: halogen, 12V MR16, 100 hr. die cast head, glare free, sealed beam.
- .2 Recessed ceiling mounted: fully recessed housing, par 36 lamp, 12V, 50W.
- .10 Cabinet: suitable for direct or shelf mounting to wall and c/w knockouts for conduit. Removable or hinged front panel for easy access to batteries.
- .11 Finish: White.
- .12 Auxiliary equipment:
- .1 Test switch.
- .2 AC input and dc output terminal blocks inside cabinet.
- .3 Bracket.

- 2.1 Equipment (Cont'd) .12 Auxiliary equipment:(Cont'd)
- .4 Cord and single twist-lock plug connection for ac.
  - .5 Ammeter, voltmeter, low-volts disconnect, time delay relay, DC terminal blocks inside enclosure.
  - .6 RFI suppressors.
  - .7 Self diagnosis circuitry.
- 2.2 Wiring of Remote Heads .1 Conduit: type EMT.
- .2 Conductors: RW-90 type to Section 26 05 21- sized in accordance with manufacturer's recommendations, minimum #10 AWG. Larger wire sizes to account for voltage drop.

**PART 3 - EXECUTION**

- 3.1 Installation .1 Install unit equipment and remote mounted fixtures.
- .2 Direct heads.
- .3 Connect exit lights to unit equipment.
- .4 Measure voltage at most remote light heads and verify voltage drop is not greater than 3%.

- END OF SECTION -

**PART 1 - GENERAL**

- 1.1 Related Sections .1 This section shall be read in conjunction with specification Section 26 05 00 - Electrical General Requirements, all electrical sections, and all other disciplines related to the project.
- 1.2 References .1 Underwriters Laboratories of Canada (ULC)  
.1 CAN/ULC S524-06, Installation of Fire Alarm Systems.  
.2 CAN/ULC S536-04, Inspection and Testing of Fire Alarm Systems.  
.3 CAN/ULC S537-04, Verification of Fire Alarm Systems.
- 1.3 Description of System .1 Existing system.
- 1.4 Shop Drawings .1 Submit shop drawings in accordance with Section 26 05 00.
- 1.5 Operation and Maintenance Data .1 Provide operation and maintenance data for Fire Alarm System for incorporation into manual specified in Section 26 05 00.  
.2 Include:  
.1 Operation and maintenance instructions for complete fire alarm system to permit effective operation and maintenance.  
.2 Technical data - illustrated parts lists with parts catalogue numbers.  
.3 Copy of approved shop drawings.  
.4 List of recommended spare parts for system.
- 1.6 Maintenance Materials .1 Provide maintenance materials in accordance with manufacturers recommendations.  
.2 Include:  
.1 spare glass rods for manual pull box stations if applicable.
- 1.7 Maintenance .1 Provide one year's free maintenance with two inspections by manufacturer during warranty period. Inspection tests to conform to CAN/ULC S536. Submit inspection report to Engineer.
- 1.8 Training .1 Arrange and pay for on-site lectures and demonstrations by fire alarm equipment manufacturer to train operational personnel in use and maintenance of fire alarm system.

## **PART 2 - PRODUCTS**

- 2.1 Materials .1 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- 2.2 Power Supply .1 120 V, ac, 60 Hz input, 24 V dc output from rectifier to operate alarm and signal circuits, with standby power of gell cell batteries minimum expected life of 4 years, sized in accordance with O.B.C.
- 2.3 Automatic Alarm Initiating Devices .1 Heat detectors, fixed temperature, non-restorable, rated 57°C plug-in base, low profile.
- .2 Thermal fire detectors, combination fixed temperature and rate of rise, non-restorable fixed temperature element, self-restoring rate of rise, fixed temperature 57°C, rate of rise 8.3°C per minute, plug-in base, low profile.
- .3 Smoke detector: ionization type, air duct type with sampling tubes with protective housing.
- .1 Twistlock Plug-in type with fixed base.
- .2 Wire-in base assembly with integral red alarm LED, and terminals for remote alarm LED.
- 2.4 Audible Signal Devices .1 Bells: vibrating type, gongs of special alloy steel, 24 V dc, 150 mm, 90 db.

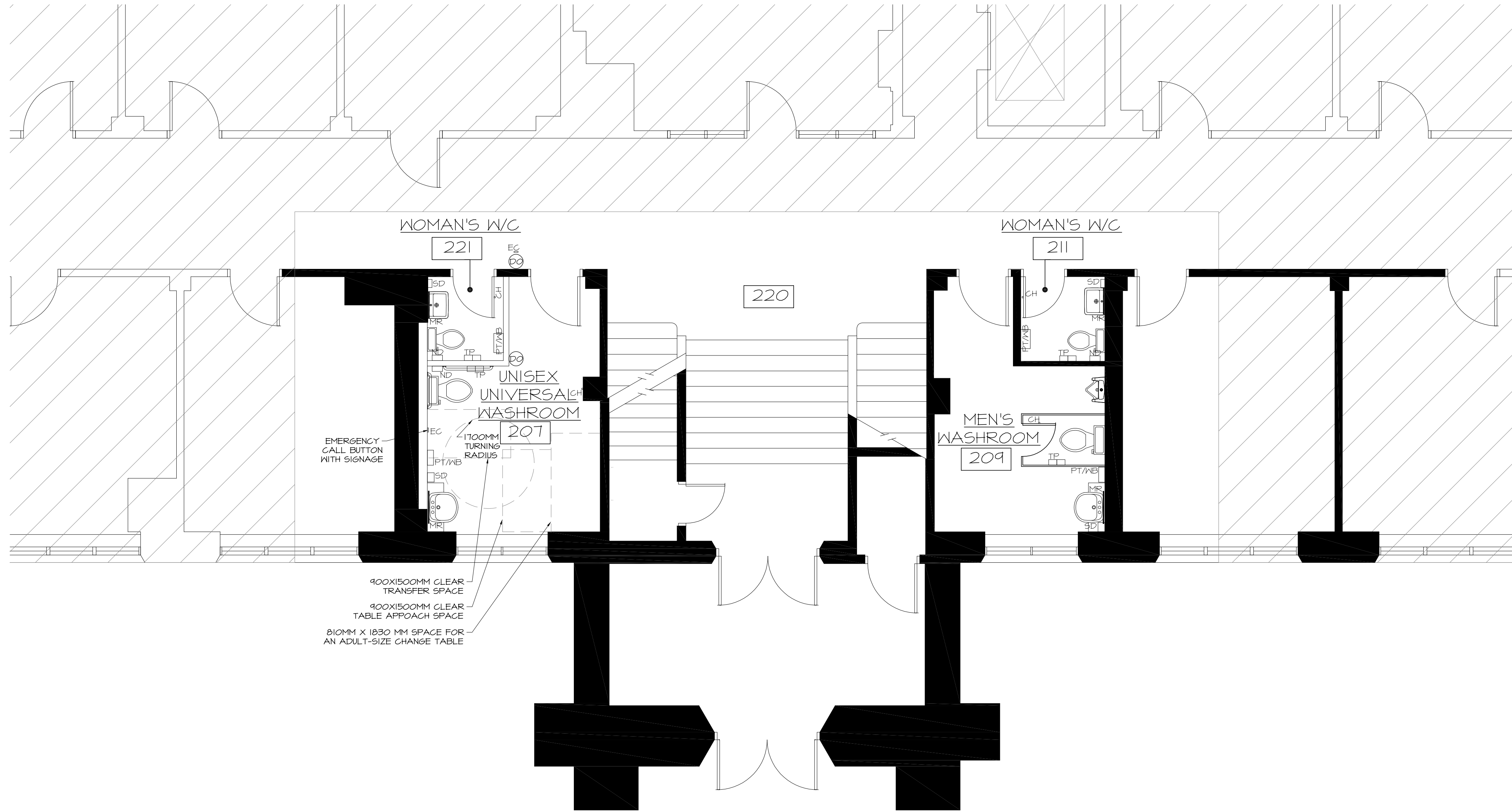
## **PART 3 - EXECUTION**

- 3.1 Installation .1 Install systems in accordance with CAN/ULC S524.
- .2 Locate and install detectors and connect to alarm circuit wiring. Do not mount detectors within 1 m of air outlets. Maintain at least 600 mm radius clear space on ceiling, below and around detectors. Locate duct type detectors in straight portions of ducts.
- .3 Connect alarm circuits to main control panel.
- .4 Locate and install signal devices and connect to signalling circuits. Alternate signal circuits within floor space, i.e.: 'A' circuit signal device adjacent to 'B' circuit signal device.
- .5 Connect signalling circuits to main control panel.
- .6 All Fire Alarm devices shall have both the device and it's base labeled with p-touch to indicate building (if in a campus), floor, column line, device type. i.e. device labelled as T2-5-G3-SD would indicate tower 2, floor 5, column G3, smoke detector. This description should also be indicated at the annunciator and control panel.
- .7 All fire alarm work is to be logged in at the main security station by the contractor, and shall indicate the location of the work, a description of the work, and the name of the contractor performing the work.

**Fire Alarm Systems**

- 3.1 Installation (Cont'd) .8 The installing contractor shall notify the building owner of verification times, so the owner can include their maintenance contractor in review.
- 3.2 Field Quality Control .1 Manufacturer to perform tests in accordance with Section 26 05 00 - Electrical General Requirements and CAN/ULC S537. Submit technicians report of individual device test results and recommendations and submit final certificate once system has been completed.
- .2 Fire alarm system:
- .1 Test each device and alarm circuit to ensure thermal and smoke detectors, transmit alarm to control panel and actuate general alarm and ancillary devices.
  - .2 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of system.
  - .3 Class B circuits.
    - .1 Test each conductor on all circuits for capability of providing alarm signal on line side of single open-circuit fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
    - .2 Test each conductor on all circuits for capability of providing alarm signal during ground-fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.

- END OF SECTION -



1 GENERAL ARRANGEMENT PLAN  
 ID-1 SCALE: 1:50

PROJECT GENERAL NOTES

- THE CONTRACTOR IS RESPONSIBLE FOR THE REVIEW OF THIS DRAWING PACKAGE IN CONJUNCTION WITH ALL OTHER DRAWINGS INCLUDING OTHER CONSULTANT'S DRAWINGS. ANY DISCREPANCIES BETWEEN DRAWINGS MUST BE REPORTED TO THE DESIGNER FOR CLARIFICATION DURING THE TENDER PROCESS AND PRIOR TO CONSTRUCTION.
- THE CONTRACTOR IS REQUIRED TO VISIT SITE, VERIFY, AND FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS.
- CONTRACTOR TO ENSURE THAT ALL WORK CONFORMS WITH THE O.B.C., N.B.C., AND ALL APPLICABLE LOCAL, BY-LAWS AND REPORT ANY CONCERNS OR NON-COMFORMANCE TO THE DESIGNER PRIOR TO COMMENCEMENT OF WORK.
- RESERVED.
- IT IS THE CONDITION OF THIS CONTRACT, THAT THE CONTRACTOR WILL, IN THE PERFORMANCE OF THE SERVICES FOR THE COMPANY AS DESCRIBED IN THIS CONTRACT, COMPLY WITH ANY AND ALL MUNICIPAL, PROVINCIAL, AND FEDERAL LAWS, REGULATIONS AND BY-LAWS INCLUDING BUT NOT LIMITED TO THOSE CONCERNING THE ENVIRONMENT AND THE DISPOSAL OF WASTE. IT IS INCUMBENT UPON THE CONTRACTOR TO INFORM ITSELF OF ANY SUCH LEGISLATION AND THE CONTRACTOR AGREES THAT IN THE EVENT OF NON-COMPLIANCE WITH THIS LEGISLATION, IT WILL INDEMNIFY AND HOLD HARMLESS THE COMPANY FROM ANY COSTS AND DAMAGES RESULTING FROM SUCH NON-COMPLIANCE.
- CONTRACTOR TO CONSULT DEPARTMENTAL REPRESENTATIVE IF ANY DISCREPANCIES, PROBLEMS, OR CHANGES OCCUR PRIOR TO COMMENCING WORK.
- CONTRACTOR TO CONSULT DEPARTMENTAL REPRESENTATIVE BEFORE WORK COMMENCES ON PARTICULAR ITEMS WHERE DESIGNER APPROVAL IS REQUIRED.
- CONTRACTOR SHALL ONLY MAKE CHANGES TO THE DESIGN OR MATERIALS SPECIFIED UPON WRITTEN APPROVAL FROM DEPARTMENTAL REPRESENTATIVE.
- REFER TO MECHANICAL & ELECTRICAL CONSULTANT'S DRAWINGS AND SPECIFICATIONS FOR ALL MECHANICAL AND ELECTRICAL SCOPE OF WORK REQUIRED.
- ALL TRADES SHALL COOPERATE TO FACILITATE SPEEDY EXECUTION OF WORK. GENERAL CONTRACTOR RESPONSIBLE FOR THE COMPLETION OF THEIR SUBCONTRACTORS WORK. SUBCONTRACTORS ARE RESPONSIBLE FOR THE PROTECTION OF THEIR WORK AND MATERIALS FOLLOWING DAILY COMPLETION.
- CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING, PATCHING WORK AND KEEPING PREMISES CLEAN AND FREE OF DEBRIS DURING ONGOING WORK AND IS RESPONSIBLE FOR PROPER CLEANING UPON COMPLETION OF WORK.
- ALL WORK ON THE CONSTRUCTION SITE SHALL BE DONE TO THE HIGHEST POSSIBLE STANDARDS.
- ANY DAMAGE TO THE BASE BUILDING OR PREMISES CAUSED BY THE CONTRACTOR OR HIS EMPLOYEE OR SUBCONTRACTORS DURING THE CONSTRUCTION OF THIS PROJECT SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- CONTRACTOR SHALL REMOVE EXISTING EQUIPMENT AND FINISHES NOT REQUIRED FOR THIS PROJECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANUP AND REMOVAL OF ALL DEBRIS AND MATERIALS NO LONGER NECESSARY ON THE JOB SITE. THE CONSTRUCTION SITE MUST BE BROOM SWEPT EACH DAY.
- EXISTING ELEMENTS IN SCOPE OF WORK SUCH AS DRYWALL, BULKHEADS, AND WALLS ETC. TO REMAIN, MUST BE SANDED AND REPAIRED AS NECESSARY. IF DAMAGED DURING THIS PROJECT, THEY ARE TO BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF EXISTING SUSPENDED CEILING TILES GRID AND SUSPENDED OR RECESSED LIGHT FIXTURES. TILES DAMAGED AND/OR SOILED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE GRINDING AND/OR FILLING OF ALL FLOOR SLAB IRREGULARITIES AND MAKE READY TO RECEIVE NEW FLOOR FINISHES.
- CONTRACTOR TO RETAIN ALL LEFTOVER FINISHES AND TURN THEM OVER TO DEPARTMENTAL REPRESENTATIVE AT THE COMPLETION OF PROJECT (PAINT, CARPET, WALL COVERINGS, ETC.).
- GENERAL CONTRACTOR ASSUMES RESPONSIBILITY FOR THE COORDINATION AND QUALITY CONTROL OF ALL TRADES THAT WILL BE PRESENT ON SITE. EXAMPLES: FURNITURE INSTALLERS, DATA CABLING PROVIDER AND HIGH DENSITY SHELVING PROVIDER.
- THE DEPARTMENTAL REPRESENTATIVE IS RESPONSIBLE FOR THE I.T. ROOM, LAB ROOM AND SERVER ROOM EQUIPMENT SELECTION AND LAYOUT. SHOULD THEY NOT HAVE A DESIGNATED SERVER ROOM DESIGN CONSULTANT, ASDS WILL MAKE RECOMMENDATION OF AN APPROPRIATE CONSULTANT FOR SAID WORK. ALL ASSOCIATED EFFORT AND COST INCURRED NOT LIMITED TO AND INCLUDING DISBURSEMENTS FOR THE DESIGNER AND ASSOCIATED CONSULTANT WILL BE AT THE CLIENT'S EXPENSE.
- THE DEPARTMENTAL REPRESENTATIVE IS RESPONSIBLE FOR ALL CABLING, COMMUNICATION AND SECURITY ASSOCIATED WITH THE PROJECT. THE CLIENT MUST PROVIDE SPECIFICATIONS FOR ALL AUDIOVISUAL EQUIPMENT FOR DESIGNER COORDINATION PRIOR TO THE TENDERING OF DESIGN DRAWINGS.

SHOP DRAWINGS

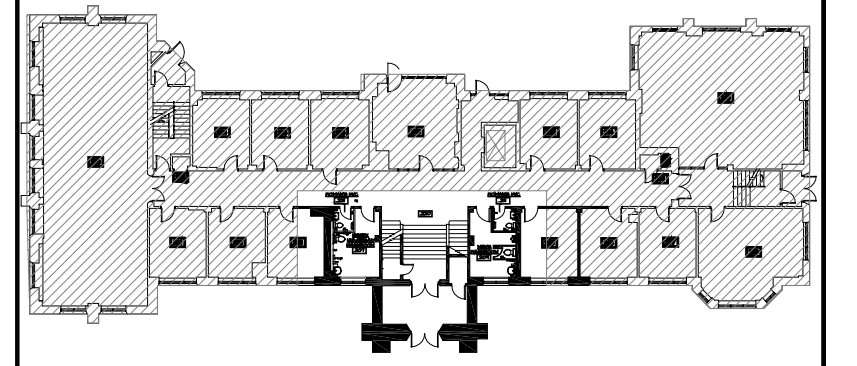
- REPRODUCIBLE SHOP DRAWINGS TO BE PROVIDED BY THE CONTRACTOR FOR DEPARTMENTAL REPRESENTATIVE'S REVIEW PRIOR TO START OF FABRICATION. DESIGNER WILL REVIEW AND TURN AROUND WITHIN THREE WORKING DAYS. AS NOTED, IT IS THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS RESPONSIBILITY TO VERIFY SITE CONDITIONS, OBTAIN NECESSARY DIMENSIONS OF ROOM AND SPACES FOR LOCATION OF NEW MILLWORK CEILING DETAILS, ETC. PRIOR TO FABRICATION.
- CONTRACTOR IS RESPONSIBLE TO NOTIFY THE DESIGNER OF ANY DISCREPANCIES, CONCERNS, WITH METHOD OF FABRICATION, DRAWING DETAILS, SITE CONDITIONS, ETC. PRIOR TO FABRICATION AND INSTALLATION ON SITE.

CONTROL SAMPLES

- CONTRACTOR SHALL PROVIDE DUPLICATE CONTROL SAMPLES OF ALL FINISHES TO DEPARTMENTAL REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION AND/OR FABRICATION.

STORAGE AND DELIVERY

- ALL MATERIALS TO BE DELIVERED AND STORED IN ORIGINAL PACKAGING OR PACKING MATERIAL AND STORED IN A DRY PROTECTED AREA AS PER MANUFACTURERS' INSTRUCTIONS. CONTRACTOR TO COORDINATE THE DELIVERY AND STORAGE DETAILS WITH LANDLORD AND/OR PROPERTY MANAGER.
- CONTRACTOR TO REVIEW WITH DEPARTMENTAL REPRESENTATIVE TO ENSURE ELEVATORS CAN ACCOMMODATE LARGE ITEMS TO BE DELIVERED TO SITE.



KEY PLAN

CLIENT UNDERSTANDING

THE UNDERSIGNED CLIENT HAS REVIEWED THIS SET OF DOCUMENTS AND AGREES THAT THE CLIENT IS SATISFIED WITH THE SCOPE OF WORK AGREED UPON.

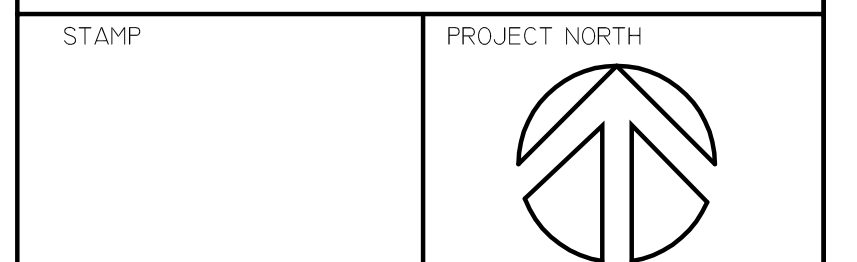
- ANY CHANGES, ADDITIONS, OR REVISIONS ARE SUBJECT TO RE-PRICING.

CLIENT'S SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

3	11/22/2015	Issued for Tender
2	11/02/2015	Issued for Tender
1	10/30/2015	Issued for 49% review
NO.	DATE	REVISION

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THE CONTRACTOR IS TO VERIFY DIMENSIONS AND DATA NOTED HERE-IN WITH CONDITIONS ON THE SITE AND IS HELD RESPONSIBLE FOR REPORTING ANY DISCREPANCIES TO THE DESIGNERS FOR ADJUSTMENT.



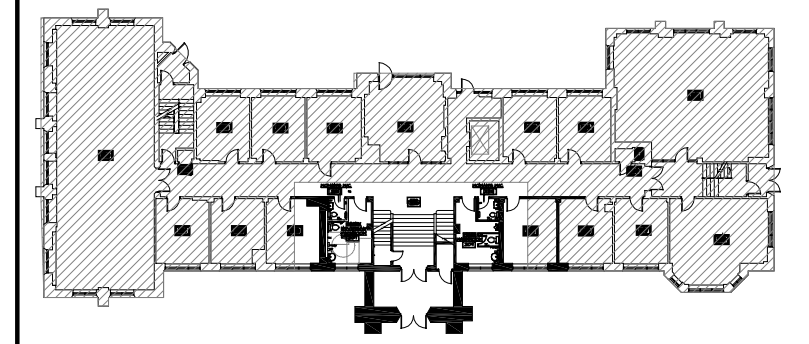
A	DETAIL NUMBER	A
B	LOCATION ON DRAWING NO.	B
C	DRAWING NUMBER	C

PROJECT  
 AGRICULTURE AND AGRICULTURE AND AGRI-FOOD CANADA  
 BUILDING 49  
 CENTRAL EXPERIMENTAL FARM

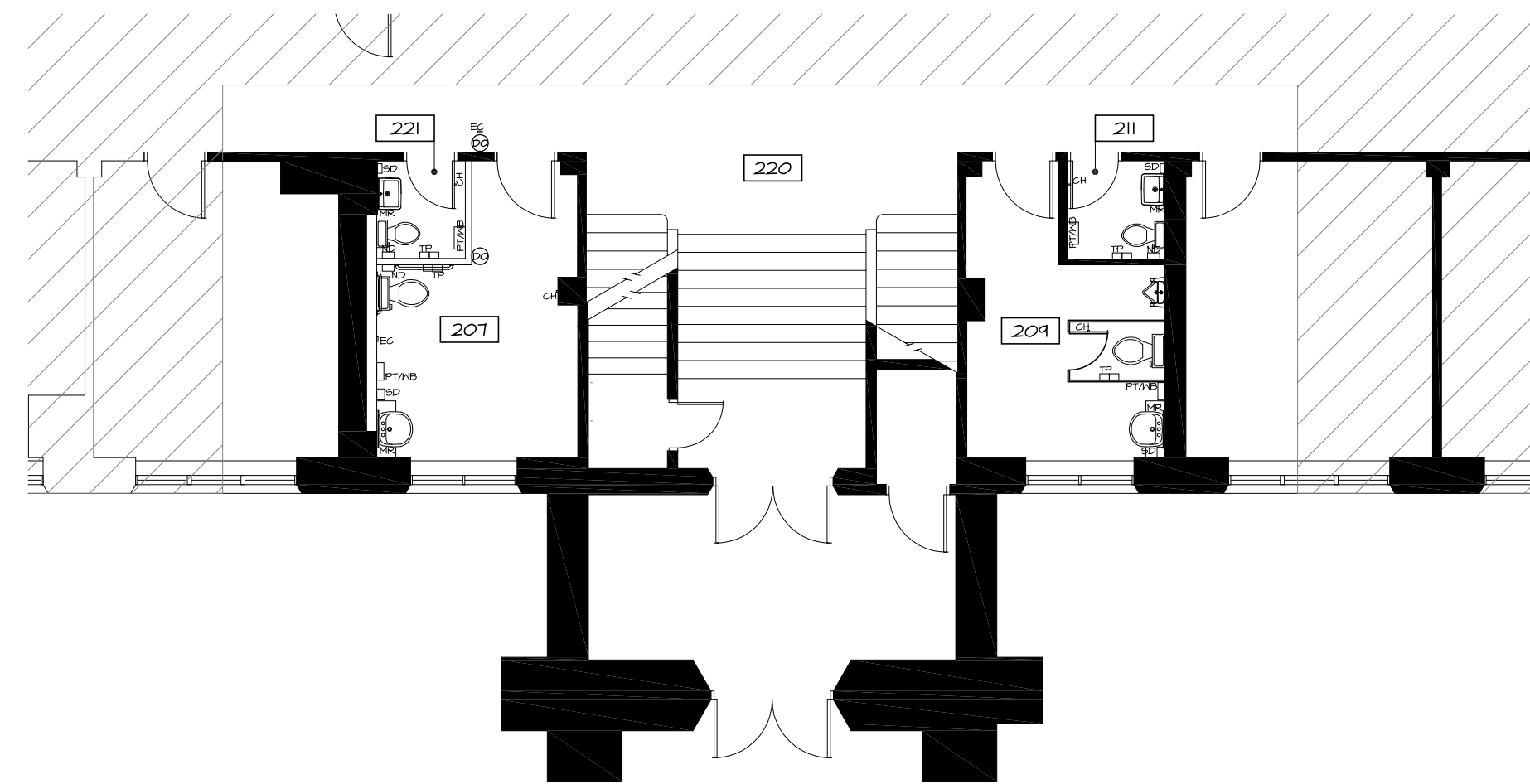
DRAWING TITLE  
 GENERAL NOTES AND GENERAL ARRANGEMENT PLAN  
 GROUND FLOOR

SCALE	AS NOTED	DRAWN BY	EG	DESIGNED BY	EG/AH
DATE	OCTOBER 1, 2015	CHECKED BY	SAS		
PROJECT NO.	A654	DRAWING NO.	ID-1		

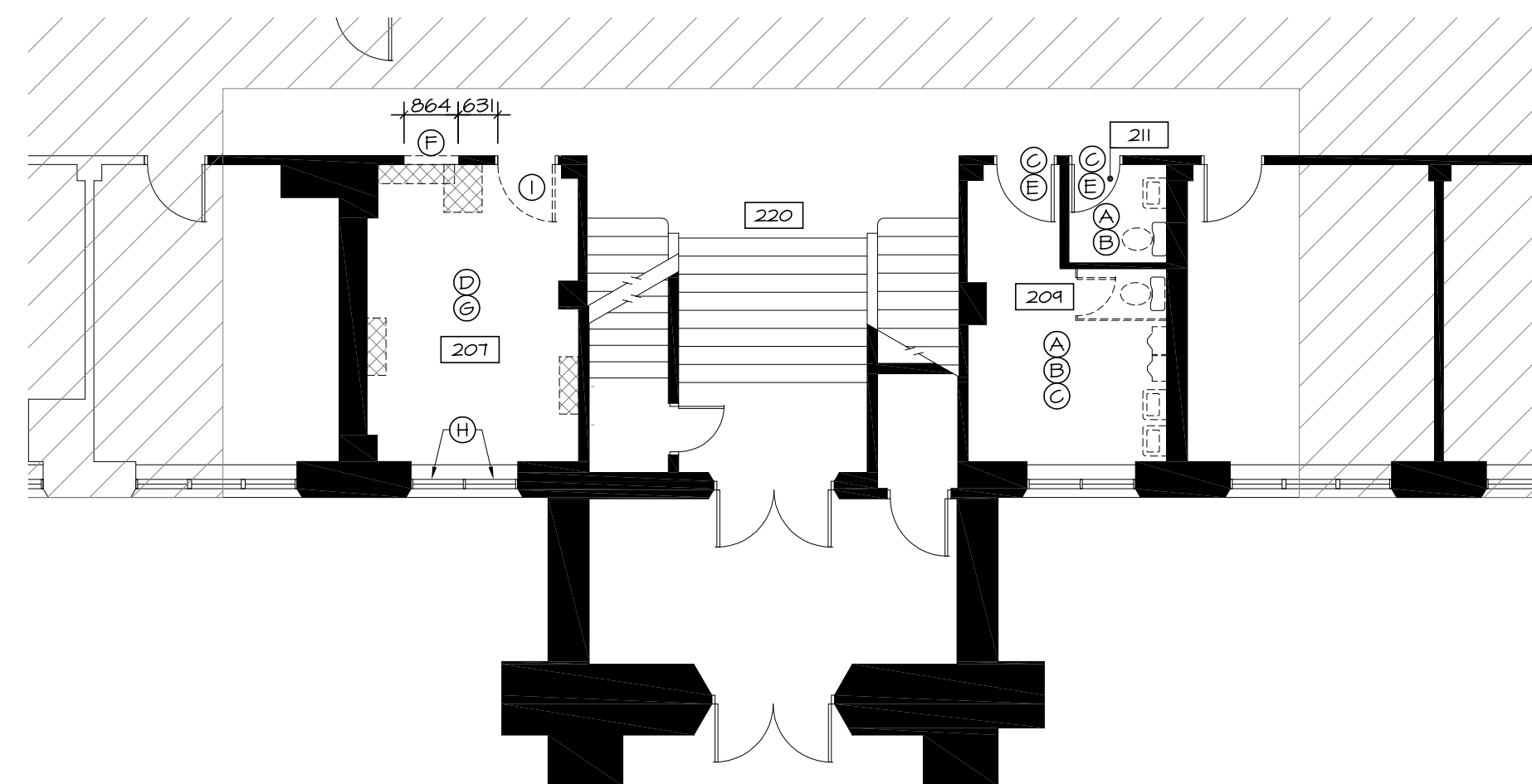




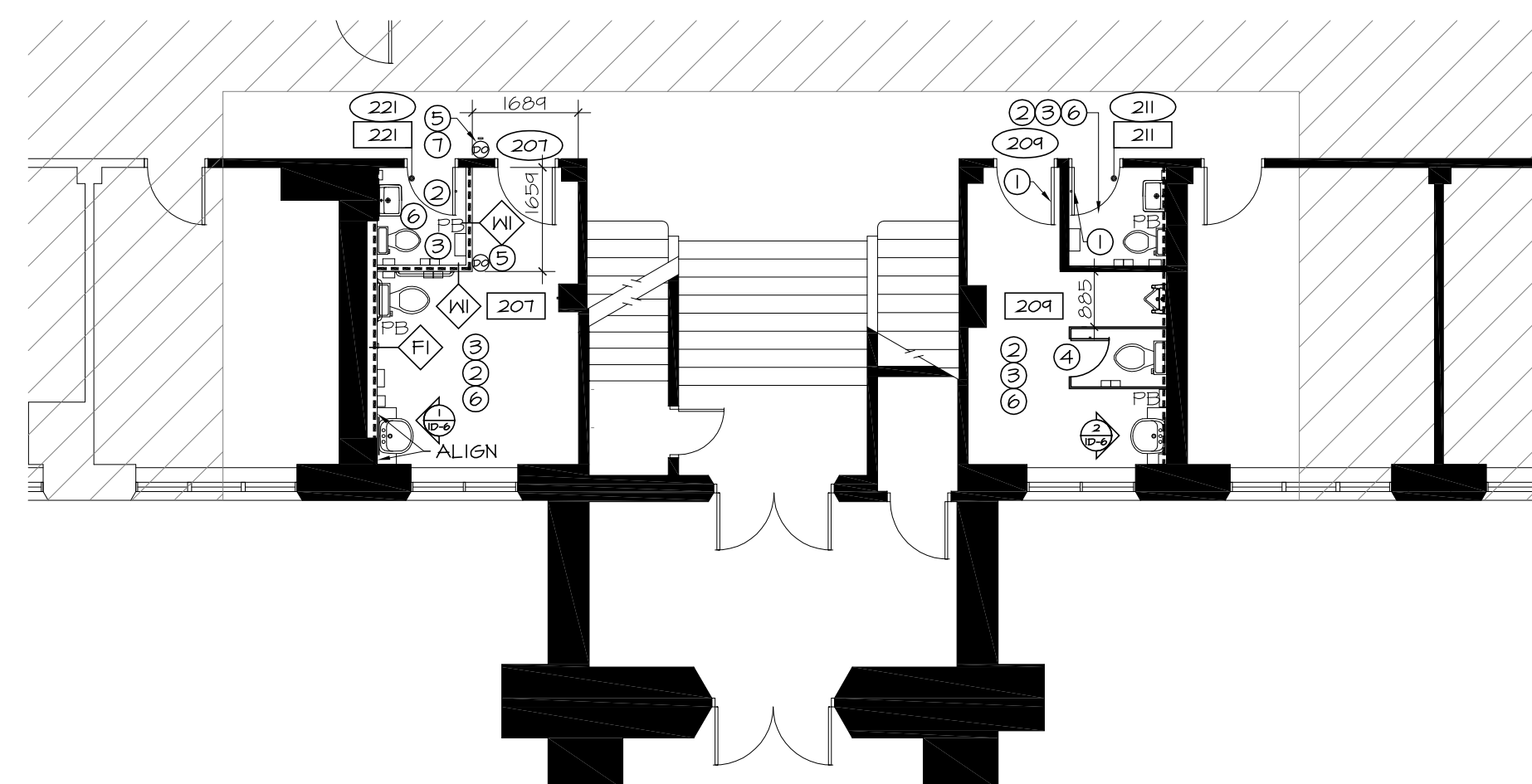
KEY PLAN



1 EQUIPMENT PLAN  
ID-2 SCALE: 1:100



2 DEMOLITION PLAN  
ID-2 SCALE: 1:100



3 PARTITION PLAN  
ID-2 SCALE: 1:100

DEMOLITION LEGEND	
	EXISTING PARTITION TO REMAIN.
	EXISTING DOOR AND FRAME TO REMAIN.
	EXISTING DOOR TO BE REMOVED, FRAME TO REMAIN.
	EXISTING PARTITION TO BE REMOVED.
	EXISTING TOILET FIXTURE TO BE REMOVED, REFER TO MECHANICAL DRAWINGS.
	EXISTING SINK FIXTURE TO BE REMOVED, REFER TO MECHANICAL DRAWINGS.
	EXISTING URINAL FIXTURE TO BE REMOVED, REFER TO MECHANICAL DRAWINGS.
	CAREFULLY REMOVE EXISTING MILLWORK. RETURN TO DEPARTMENTAL REPRESENTATIVE. REPAIR WALLS AS REQUIRED TO MAKE AS NEW PATCH/SAND/REPAIR & MAKE READY TO RECEIVE NEW FINISH.

DEMOLITION GENERAL NOTES

- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT CONSTRUCTION DRAWINGS AND SPECIFICATIONS INCLUDING ALL THOSE BY MECHANICAL ENGINEERS, ELECTRICAL ENGINEERS, OTHER, ECT.
- CONTRACTOR TO INSPECT EXISTING SITE PRIOR TO START OF PROJECT TO IDENTIFY DISCREPANCIES AND REPORT TO DESIGNER FOR ADJUSTMENT TO DRAWING(S).
- CONTRACTOR TO COORDINATE WITH DEPARTMENTAL REPRESENTATIVE PRIOR TO START OF WORK FOR SCHEDULING OF APPROVED WORK, OF ALL SERVICES SHUT DOWN, AND DELIVERY OF MATERIALS.
- COORDINATE ALL DEMOLITION WORK WITH DEPARTMENTAL REPRESENTATIVE AND OBTAIN APPROVAL WHEN NECESSARY FOR SPECIAL DEMOLITION ACTIVITIES AFFECTING LIFE SAFETY AND BASE BUILDING SERVICES OF ALL BUILDING OCCUPANTS.
- EXISTING AFFECTED FLOORS TO BE REPAIRED AND CLEANED OF ALL UNWANTED RESIDUE PRIOR TO INSTALLATION OF NEW FINISHES.
- ALL EXISTING WALLS WITHIN SCOPE OF WORK TO BE PATCHED AND MADE GOOD, READY TO RECEIVE NEW FINISH. CONTRACTOR TO ENSURE INTEGRITY OF ALL RATED & NON RATED PARTITIONS ARE MAINTAINED AT LOCATIONS OF DEMOLITION.
- PATCH WALLS AND MAKE READY FOR NEW FINISH WHERE ANY EXISTING SECURITY, FIRE SAFETY EQUIPMENT, ETC. IS REMOVED.
- CONTRACTOR TO REMOVE ALL SUSPENDED CEILING TILES AS REQUIRED AND TO PROVIDE ALLOWANCE FOR REPLACEMENT OF EXISTING SUSPENDED CEILING TILES DAMAGED DURING REMOVAL AND REINSTALLATION FOR NEW WORK. ALLOWANCE FOR REPLACEMENT OF SUSPENDED CEILING TILE TO BE DETERMINED BY DEPARTMENTAL REPRESENTATIVE AND/OR PROPERTY MANAGER PRIOR TO AWARD OF CONTRACT DURING TENDER.
- CAREFULLY REMOVE ANY CEILING LIGHT FIXTURES SCHEDULED FOR REMOVAL OR RELOCATION, AS SHOWN ON ENGINEER'S LAYOUT AND RETURNED TO DEPARTMENTAL REPRESENTATIVE TO BE STORED FOR FUTURE USE. ANY LEFTOVER LIGHT FIXTURES TO BE TURNED OVER TO THE DEPARTMENTAL REPRESENTATIVE.
- REFER TO MECHANICAL AND ELECTRICAL ENGINEERING DRAWINGS FOR DEMOLITION AND PROTECTION OF ANY EXISTING BUILDING SERVICES.
- CONTRACTOR TO PROTECT WINDOW BLINDS PRIOR TO CONSTRUCTION, REMOVE PROTECTION UPON COMPLETION OF PROJECT. CLEAN WINDOW BLINDS AND FREE OF ALL CONSTRUCTION DIRT AND DUST.
- CONTRACTOR TO MAINTAIN SAFE PATH OF TRAVEL TO ALL EXITS AND EXIT STAIRS AND BUILDING WASHROOMS FOR THE DURATION OF THE PROJECT.
- IF DEMOLITION SCOPE IS SEPARATED FROM MAIN CONSTRUCTION SCOPE, DEPARTMENTAL REPRESENTATIVE AND/OR PROPERTY MANAGER REQUIRES A SEPARATE DEMOLITION PERMIT FROM THE CITY OF OTTAWA. OBTAIN REQUIRED PERMITS & INSPECTIONS FOR DEMOLITION WORK. DEPARTMENTAL REPRESENTATIVE, PROPERTY MANAGER OR CONTRACTOR MAY OBTAIN SUCH PERMIT.
- CONTRACTOR IS REQUIRED TO ERECT & MAINTAIN DUST PROOF PARTITIONS TO PREVENT THE SPREAD OF DUST, FIBRES AND ODORS CAUSED BY CONSTRUCTION TO OTHER PARTS OF THE BUILDING. UPON COMPLETION REMOVE PARTITIONS AND MAKE GOOD DAMAGED SURFACES AFFECTED BY CONSTRUCTION TO MATCH ADJACENT SURFACES.
- REMOVE DEMOLISHED MATERIAL AND DEBRIS FROM SITE ON A DAILY BASIS DURING PERFORMANCE OF WORK TO MAINTAIN A CLEAR, SAFE PATH AND ORDERLY CONSTRUCTION SITE.

DEMOLITION SPECIFIC NOTES

- EXISTING FLOOR TILE AND TILE WALL BASE TO BE REMOVED, SKIM, CLEAN & PREP SUB FLOOR AS REQUIRED TO MAKE READY TO RECEIVE NEW FLOOR FINISH.
- CAREFULLY REMOVE EXISTING PLUMBING FIXTURES, TOILET PARTITIONS (WHERE APPLICABLE) AND WASHROOM ACCESSORIES. RETURN TO DEPARTMENTAL REPRESENTATIVE. REPAIR WALLS AS REQUIRED TO MAKE AS NEW PATCH/SAND/REPAIR & MAKE READY TO RECEIVE NEW FINISH.
- EXISTING DOOR THRESHOLD TO REMAIN.
- EXISTING V&T FLOORING AND RUBBER BASE TO BE REMOVED, SKIM, CLEAN & PREP SUB FLOOR AS REQUIRED TO MAKE READY TO RECEIVE NEW FLOOR FINISH.
- CONTRACTOR TO REMOVE EXISTING DOOR KNOB HARDWARE AND REPAIR DOOR AS REQUIRED, REFER TO DOOR SCHEDULE FOR NEW HARDWARE REQUIREMENTS. RETURN ALL REMOVED HARDWARE TO DEPARTMENTAL REPRESENTATIVE.
- CONTRACTOR TO REMOVE EXISTING CONCRETE PLASTER WALL TO CREATE OPENING FOR NEW WASHROOM DOOR. PROVIDE STRUCTURAL SUPPORT OF EXISTING WALL TO REMAIN AS REQUIRED.
- DEMOLISH EXISTING PLASTER CEILING TO COMPLETE MODIFICATIONS TO PLUMBING SERVICES FROM FLOOR ABOVE AS REQUIRED. CEILING TO BE REPAIRED UPON COMPLETION WITH NEW DRYWALL CEILING. ENSURE ALL PENETRATIONS THROUGH WALLS AND FLOOR SLABS MAINTAIN THE EXISTING FIRE SEPARATION RATING. REFER TO MECHANICAL DRAWINGS AND ID-1 FOR EXTENT OF DEMOLITION AND LOCATION.
- CONTRACTOR TO CAREFULLY REMOVE EXISTING BLINDS AND RETURN TO DEPARTMENTAL REPRESENTATIVE.
- CONTRACTOR TO REMOVE EXISTING DOOR, FRAME TO REMAIN, REFER TO DOOR SCHEDULE FOR NEW DOOR AND HARDWARE REQUIREMENTS.

PARTITION & EQUIPMENT LEGEND	
	EXISTING PARTITION TO REMAIN.
	TYPE 1 TYPICAL PARTITION. FROM SLAB TO US OF EXISTING CEILING ABOVE REFER TO WALL SECTION DETAILS ON ID-5
	FURRING CHANNEL FOR PLUMBING SERVICES. 152mm STEEL STUDS, 16mm DRYWALL, CAESIDE. ENSURE OUTSIDE FACE OF FURRING WALL SITS FLUSH WITH EXISTING WALL.
	NEW OR EXISTING SINGLE DOOR. REFER TO DOOR AND HARDWARE SCHEDULE FOR DOOR SIZES, MATERIALS AND HARDWARE.
	PLYWOOD WALL BLOCKING TO BE INSTALLED WITHIN WALL CONSTRUCTION TO SUPPORT MILLWORK AND/OR WALL MOUNTED EQUIPMENT. REMOVE EXISTING WALL CONSTRUCTION TO SUIT. HEIGHT TO BE CONFIRMED BASED ON CONFIGURATION OF MILLWORK CABINETRY AND EQUIPMENT INSTALLATION.
	INDICATES DOOR NUMBER.
	INDICATES ROOM NUMBER.
	WALL MOUNTED DOUBLE ROLL TOILET PAPER DISPENSER - TWO ROLL SIDE BY SIDE WITH TRANSLUCENT PLASTIC COVER IN SMOKE/ GREY COLOUR.
	WALL MOUNTED NAPKIN DISPOSAL - BRUSHED STAINLESS STEEL WITH PIVOTING SELF CLOSING LID
	WALL MOUNTED SOAP DISPENSER 152MM H X 203MM H X 76MM D, TWO-TONE BLACK AND GREY
	WALL MOUNTED PAPER TOWEL DISPENSER AND DISPOSAL - 350MM H X 41MM H X 17MM D, BRUSHED STAINLESS STEEL.
	SURFACE MOUNTED COAT HOOK, BRUSHED STAINLESS STEEL, MOUNTED AT 1200MM A.F.F.
	SURFACE MOUNTED MIRROR - REFER TO ELEVATIONS FOR SIZE AND LOCATIONS.
	SURFACE MOUNTED AUTOMATIC DOOR OPERATOR AND WALL MOUNTED CONTROLS FOR BARRIER FREE ACCESS.
	HEADRAL BRACED STAINLESS STEEL TOILET PARTITIONS.
	SURFACE MOUNTED GRAB BARS, BRUSHED STAINLESS STEEL.
	EMERGENCY CALL BUTTON

PARTITION GENERAL NOTES

- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT CONSTRUCTION DRAWINGS AND SPECIFICATIONS INCLUDING ALL THOSE BY MECHANICAL, PLUMBING AND ELECTRICAL ENGINEERS.
- ALL DIMENSIONS ARE TAKEN FROM TO THE CENTERLINE OF PARTITION, UNLESS OTHERWISE NOTED.
- PRIOR TO ERECTING PARTITIONS THE CONTRACTOR IS REQUIRED TO CHALK ALL PARTITION LOCATIONS, AND OBTAIN APPROVAL FROM DESIGNER FOR PARTITION LAYOUT PRIOR TO COMMENCING ANY CONSTRUCTION.
- CONTRACTOR MUST ENSURE ALL PIPING, DUCT AND ANY OTHER SERVICES THAT PENETRATE NEW AND EXISTING PARTITIONS, BAFFLES OR FLOOR SLAB ARE PROPERLY SEALED AND IDENTIFY ANY DISCREPANCIES TO DESIGNER FOR ADJUSTMENTS.
- CONTRACTOR SHALL SUPPLY AND INSTALL ADEQUATE WOOD BLOCKING OR PLYWOOD STRIPS TO PROVIDE SUITABLE SUPPORT AND FASTENING OF WALL MOUNTED CABINETS, COUNTERS, ELECTRONIC EQUIPMENT, CLOSET SHELVING, FURNITURE, ETC. REFER TO THE FURNITURE & POWER, VOICE & DATA DRAWINGS FOR LOCATION AND TYPE.
- ALL EXISTING PARTITIONS AND COLUMNS TO BE PATCHED, REPAIRED, SANDED AND MADE GOOD PRIOR TO FINISH APPLICATION.
- PATCH ALL HOLES IN WALLS AS PART OF SCOPE OF WORK WHERE POWER, PHONE OR DATA HAVE BEEN REMOVED.
- REFER TO DOOR AND HARDWARE SCHEDULE FOR DOOR AND FRAME SIZE, FINISH AND DETAILS.
- ALL CLOSETS TO HAVE MINIMUM 24" CLEARANCE INSIDE, UNLESS OTHERWISE NOTED.
- CONTRACTOR TO ENSURE FLOOR SLAB IS LEVEL AT DOOR FRAMES AND SILL HEIGHTS AND REPORT IF REMEDIAL WORK IS REQUIRED TO MAKE LEVEL.
- INSTALLATION OF DOOR FRAMES AS FOLLOWS:  
ALL TOPS OF DOORS AND DOOR MUST ALIGN FOR PROPER INSTALLATION, FRAMES LOCATED IN CLOSE PROXIMITY WITHIN THE SAME PARTITION PLANE.
- CONTRACTOR TO PATCH, SAND AND MAKE ALL SURFACE WITHIN SCOPE OF WORK READY TO RECEIVE NEW FINISH.
- WHERE NEW PARTITIONS ARE CONSTRUCTED AT BUILDING PERIMETER CONVECTORS, CONSTRUCTION TO INCLUDE BAFFLE WITHIN CONVECTOR AS PART OF CONTINUOUS ACOUSTIC SEPARATION.
- ALL DOOR FRAMES TO BE INSTALLED 4" FROM PARTITIONS, UNLESS OTHERWISE NOTED.
- ALL NEW EXPOSED GYPSUM BOARD SURFACES TO BE TAPED, SANDED AND PRIME READY TO RECEIVE NEW FINISHES. ALL BAFFLES TO BE TAPED AND CAULKED.
- CONTRACTOR TO ENSURE ALL NEW PARTITIONS & BAFFLES DO NOT INTERFERE WITH ANY MECHANICAL OR ELECTRICAL SERVICES. CONTRACTOR TO REPORT ANY DISCREPANCIES WITH DESIGNER PRIOR TO COMMENCING WORK.
- IF DOOR AND DOOR FRAME INSTALLATION IS AFFECTED DIRECTLY BY UNLEVEL CONCRETE FLOOR SLAB, CONTRACTOR TO MAKE LEVEL USING CEMENTIOUS GROUT OR APPROPRIATE LEVELING METHODS.
- ANY SPECIFIED WORK THAT IS INCOMPLETE AT SCHEDULED TIME OF COMPLETION IS TO BE SCHEDULED WITH DEPARTMENTAL REPRESENTATIVE. WORK IS TO BE COMPLETED AFTER WORKING HOURS. ALL AREAS OF WORK TO BE CLEANED AT THE END OF EACH SHIFT AND RETURNED TO NORMAL WORK HOURS CONDITIONS.
- ANY CONSTRUCTION WORK (FINAL DEFICIENCIES) WHICH ARE NOT COMPLETE AT THE TIME OF TURN OVER AND DOES NOT AFFECT OCCUPANCY MUST BE SCHEDULED DIRECTLY WITH DEPARTMENTAL REPRESENTATIVE.

PARTITION SPECIFIC NOTES

- PATCH AND REPAIR ALL EXISTING DOOR BLEMISHES AND UNNECESSARY HOLES IN EXISTING DOOR AND FRAME AS REQUIRED. CLEAN AND SAND DOOR SURFACES AND RE LACQUER TO MATCH EXISTING.
- REPAIR ALL EXISTING WALL SURFACES TO BE SMOOTH AND EVEN READY FOR NEW WALL FINISHES.
- SUPPLY AND INSTALL NEW WASHROOM ACCESSORIES AS SHOWN, REFER TO PARTITION AND EQUIPMENT LEGEND. ALL ACCESSORIES TO BE MOUNTED TO OGC ACCESSIBILITY STANDARDS. REFER TO ELEVATIONS ON DRAWINGS ID-6
- CONTRACTOR TO SUPPLY AND INSTALL NEW STAINLESS STEEL HEADRAL BRACED TOILET PARTITIONS AS SHOWN. INTERIOR STALL DIMENSIONS TO BE 1524MM LONG BY 915MM WIDE.
- CONTRACTOR TO SUPPLY AND INSTALL NEW SURFACE MOUNTED AUTOMATIC DOOR OPERATOR ON EXISTING WOOD DOOR COMPLETE WITH BARRIER FREE CONTROLS AND ACCESSORIES. PUSH PLATE ON OUTSIDE OF WASHROOM TO RECEIVE SURFACE MOUNTED CONDUIT AND BE PAINTED TO MATCH ADJACENT WALL COLOUR.
- AT AREAS OF NEW PLUMBING AND MECHANICAL WORK CONTRACTOR TO REPLACE EXISTING PLASTER WITH NEW DRYWALL FINISH AND FURR FROM FLOOR TO UNDERSIDE OF FLOOR ABOVE AS REQUIRED AND CLAD WITH 19MM GYPSUM BOARD.
- CONTRACTOR TO ALLOW FOR PATCH AND REPAIR OF WALLS AND CEILING AS REQUIRED TO ACCOMMODATE NEW ELECTRICAL WORK. REFER TO ELECTRICAL DRAWINGS FOR EXTENT OF WORK.

NO.	DATE	REVISION
3	11/02/2015	Issued for Tender
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THE CONTRACTOR IS TO VERIFY DIMENSIONS AND DATA NOTED HERE-IN WITH CONDITIONS ON THE SITE AND IS HOLD RESPONSIBLE FOR REPORTING ANY DISCREPANCIES TO THE DESIGNERS FOR ADJUSTMENT.

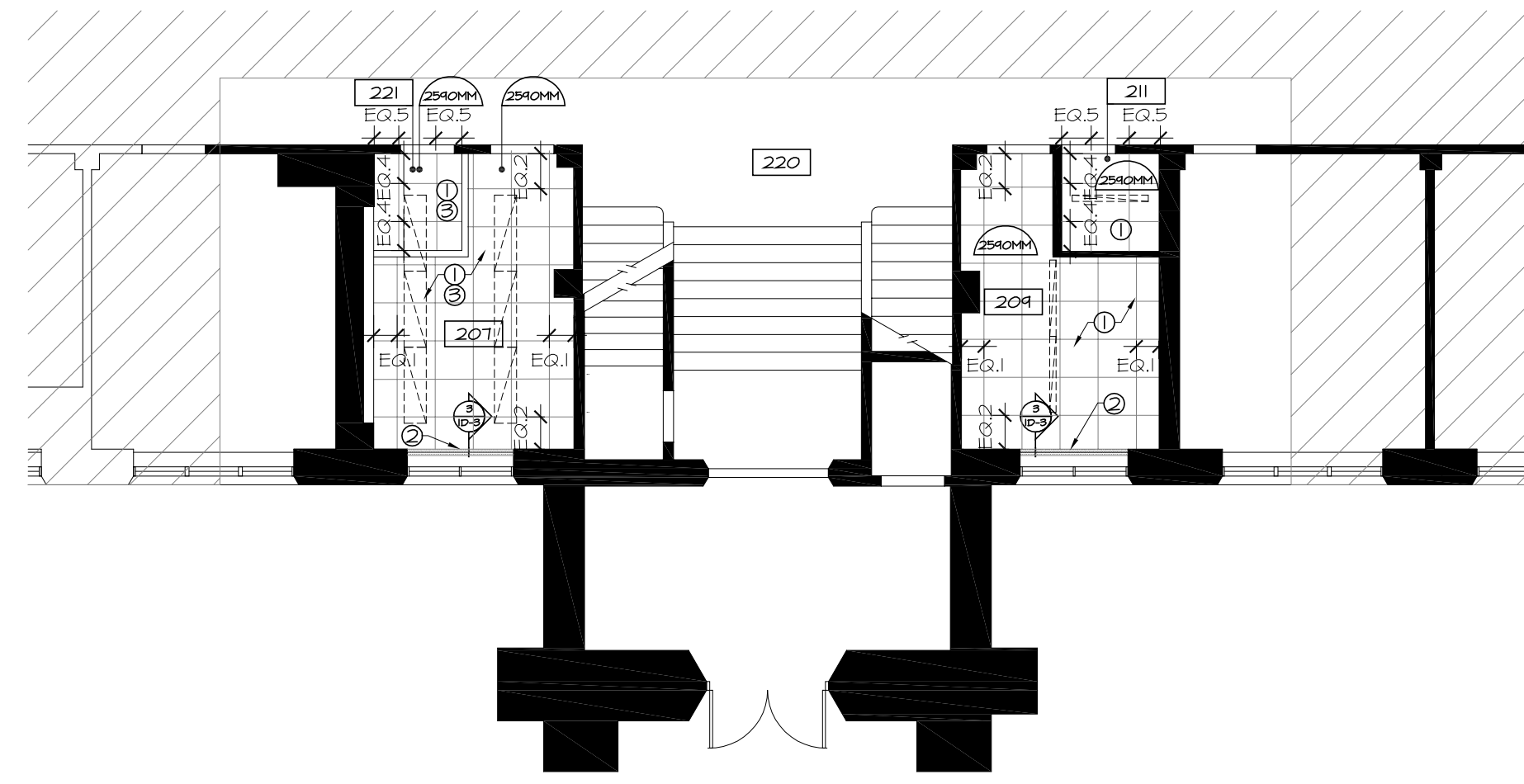
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B	LOCATION ON DRAWING NO.
C	DRAWING NUMBER

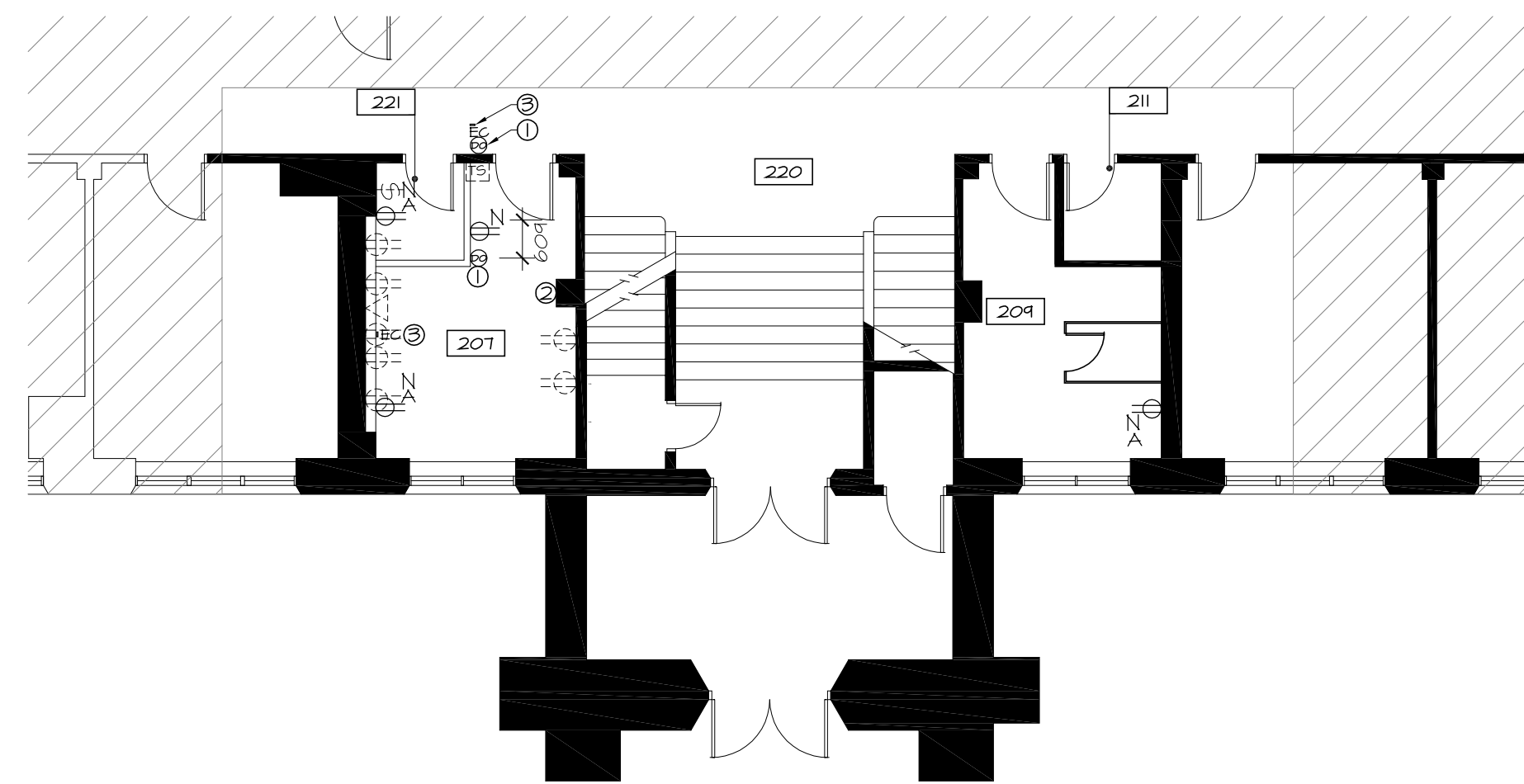
PROJECT  
AGRICULTURE AND AGRICULTURE AND AGRI-FOOD CANADA  
BUILDING 49  
CENTRAL EXPERIMENTAL FARM

DRAWING TITLE  
EQUIPMENT, DEMOLITION AND PARTITION PLAN  
GROUND FLOOR

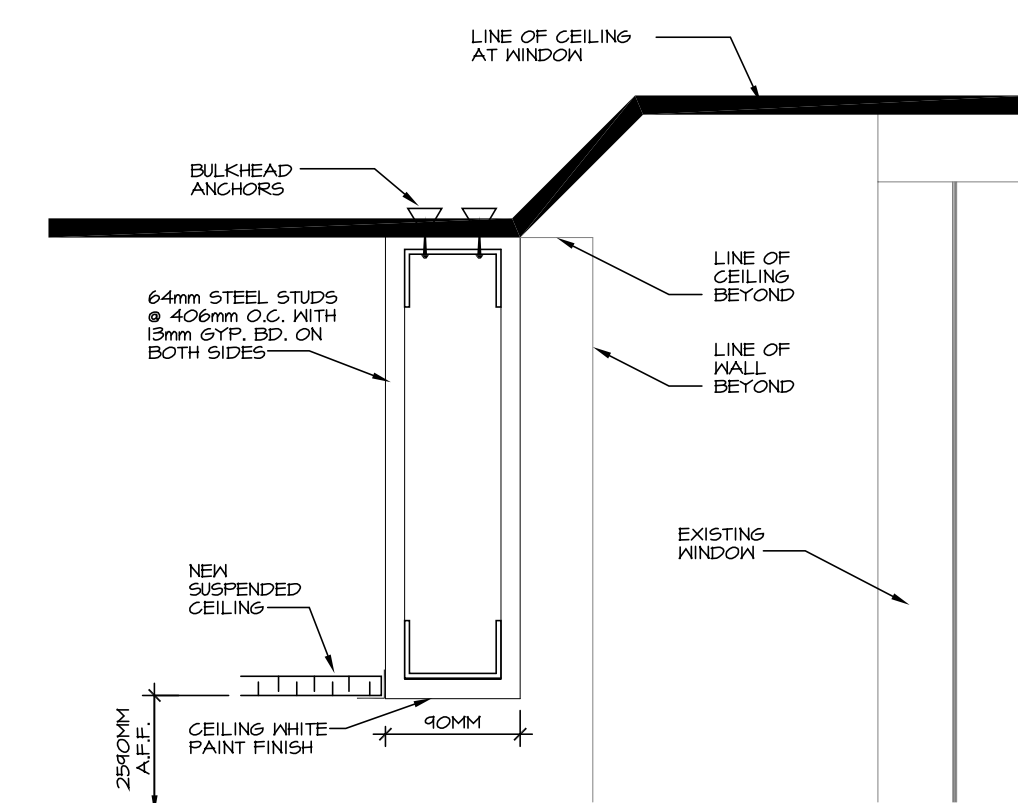
SCALE	AS NOTED	DRAWN BY	EG	DESIGNED BY	EG/AH
DATE	OCTOBER 1, 2015	CHECKED BY	5AS		
PROJECT NO.	A654	DRAWING NO.	ID-2		



1 REFLECTED CEILING PLAN  
ID-3 SCALE:1:100



2 POWER VOICE AND DATA PLAN  
ID-3 SCALE:1:100



3 CEILING BULKHEAD DETAIL  
ID-3 SCALE:NTS

REFLECTED CEILING LEGEND

	EXISTING SURFACE MOUNTED LIGHT FIXTURES TO BE REMOVED. REFER TO ENGINEER'S DRAWINGS FOR NEW LIGHTING SPECIFICATIONS AND LOCATIONS.
	NEW SUSPENDED CEILING TILE SYSTEM SUITABLE FOR INSTALL IN MOISTURE PRONE AREAS. 303MM X 303MM X 24 MINERAL CORE TILE WITH REINFORCED MAT FACE. NRC - 0.55 CAC - 38. LR - .82 AT 2540MM +/- A.F.F.
	CEILING HEIGHT AS NOTED ON PLAN.
	NEW DRYWALL BULKHEAD AT WINDOW OPENINGS. REFER TO DETAIL ON THIS PAGE. DRYWALL TO BE PAINTED CEILING WHITE.

REFLECTED CEILING GENERAL NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT CONSTRUCTION DRAWINGS AND SPECIFICATIONS INCLUDING ALL THOSE BY MECHANICAL AND ELECTRICAL ENGINEERS, STRUCTURAL ENGINEERS AND AUDIO VISUAL CONSULTANTS, AS REQUIRED TO ENSURE PROPER COORDINATION AND INSTALLATION.
- DESIGN DRAWINGS ARE FOR LIGHT FIXTURE LOCATION AND FINISH ONLY. REFER TO ELECTRICAL CONSULTANT'S DRAWINGS FOR ALL ELECTRICAL INSTALLATION AND PERFORMANCE SPECIFICATIONS. (I.E. LIGHT LEVELS ECT.)
- ALL LIGHT SWITCHES, FAN SWITCHES, POWER OUTLETS AND VOICE AND DATA COVER PLATES TO RECEIVE WHITE COVER PLATES THROUGHOUT. ANY EXISTING COVER PLATES THAT ARE NOT ALREADY WHITE ARE TO BE REPLACED WITH WHITE COVER PLATES FOR CONSISTENCY. ELECTRICAL AND CABLEING CONTRACTORS TO ADVISE DESIGNER OF DISCREPANCIES AND OBTAIN DIRECTION AND APPROVAL PRIOR TO ORDERING COVER PLATES AND FINAL INSTALLATION.
- ALL BASE BUILDING LIGHT FIXTURES NOT UTILIZED ARE TO BE CAREFULLY REMOVED AND TURNED OVER TO THE DEPARTMENTAL REPRESENTATIVE.
- PRIOR TO TENDERING DRAWINGS, ENGINEERS SHALL VERIFY SITE TO ASSURE PLENUM CAN ACCOMMODATE SPECIFIED FIXTURES (I.E. RECESSED 4 PENDANT FIXTURES, DRIVERS, EQUIPMENT, HEATING, COOLING AND RETURN AIR DUCTS). ENGINEER TO ALERT DEPARTMENTAL REPRESENTATIVE TO ANY DISCREPANCIES PRIOR TO TENDERING DRAWINGS.
- ALL DRYWALL CEILING SURFACES AND EDGES TO BE PAINTED CEILING WHITE UNLESS OTHERWISE NOTED. BORDER OF LINEAR DIFFUSERS ON DRYWALL TO BE PAINTED TO MATCH BULKHEAD, PATCH, SAND & RE-FINISH EXISTING ELEMENTS TO REMAIN (I.E. BULKHEADS, COLLINGS AND WALLS) AS REQUIRED TO MAKE AS-NEW. ANY DAMAGED ELEMENTS TO BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.
- ONCE CONTRACT IS AWARDED, CONTRACTOR SHALL VERIFY SITE TO ENSURE PLENUM ACCOMMODATES SPECIFIED FIXTURES (I.E. RECESSED 4 PENDANT FIXTURES, DRIVERS, PROJECTION SCREENS, MECHANICAL AIR DUCTS). CONTRACTOR TO ALERT DEPARTMENTAL REPRESENTATIVE TO ANY DISCREPANCIES PRIOR TO RELEASE OF SHOP DRAWINGS. ANY ERRORS/OMISSIONS/CHANGES AS A RESULT OF FAILING TO FOLLOW THE ABOVE DIRECTIVE WILL BE REMEDIATED AT CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL ISSUE SHOP DRAWINGS FOR DESIGN CONSULTANT'S REVIEW WITHIN THREE (3) BUSINESS DAYS OF AWARD OF CONTRACT. UPON RECEIPT OF APPROVED SHOP DRAWINGS, CONTRACTOR SHALL PLACE ORDER NO LATER THAN TWO (2) BUSINESS DAYS. CONTRACTOR TO ALERT DEPARTMENTAL REPRESENTATIVE/PROPERTY MANAGER AND DESIGNER OF EXPECTED DELIVERY DATE TO SITE IN WRITING BEFORE CONSTRUCTION COMMENCEMENT. ANY ERRORS/OMISSIONS/CHANGES AS A RESULT OF FAILING TO FOLLOW THE ABOVE DIRECTIVE WILL BE REMEDIATED AT CONTRACTOR'S EXPENSE.
- ALL SWITCHES WHEN SHOWN SIDE BY SIDE ON PLAN, TO BE GANGED BEHIND COMMON FACE PLATE. OR IF NOT POSSIBLE, THEN INSTALLED SIDE BY SIDE ALLOWING FOR MINIMUM SPACING BETWEEN COVER PLATES AND ALIGNED WITH ONE ANOTHER ON THE WALL AS CLOSE TO DOOR AS POSSIBLE. CONTRACTOR TO ADVISE DESIGNER OF ANY CONCERNS OR DISCREPANCIES AND APPROVAL PRIOR TO ORDERING COVER PLATES AND FINAL INSTALLATION.
- CONTRACTOR TO COORDINATE WITH MECHANICAL AND ELECTRICAL ENGINEER'S DRAWINGS FOR LOCATIONS AND QUANTITY OF ALL SERVICE ACCESS PANELS. WHERE DRYWALL CEILING CONSTRUCTION IS SPECIFIED, CONTRACTOR TO ALLOW FOR AND INCLUDE IN TENDER: ONE (1) ACCESS PANEL PER BULKHEAD, ONE (1) ACCESS PANEL PER EVERY 100 SQ FT IN A MEETING OR OTHER ENCLOSED ROOM, AND ONE (1) ACCESS PANEL PER EVERY 10 LI FT IN CORRIDOR OR AS BASE BUILDING ELEMENTS DICTATE. ALL ACCESS PANELS TO BE RECESSED TRIMLESS WITH MUDDED DRYWALL FLANGE. SEE SPECIFICATION AS FOLLOWS:  
MODEL: RECESSED ACCESS DOOR WITHOUT FLANGE  
MATERIAL: STAINLESS STEEL  
FINISH: WHITE POWDER COAT  
DEPTH: STANDARD 5/8" OR TO SUIT (FILL WITH 5/8 THK MATERIAL TO MATCH ADJACENT SURFACE IN MATERIAL, FINISH & COLOUR)  
NOTE: CONTRACTOR TO FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- CONTRACTOR TO CARRY AN ALLOWANCE OF 5% OF AREA IN SCOPE OF WORK TO REPLACE DAMAGED AND OLDER EXISTING CEILING TILES. FINAL ALLOWANCE PERCENTAGE TO BE CONFIRMED BY DEPARTMENTAL REPRESENTATIVE DURING TENDERING OF WORK AND PRIOR TO AWARDING OF CONSTRUCTION CONTRACT.
- CONTRACTOR TO CARRY AN ALLOWANCE TO REPLACE DAMAGED AND/OR OLDER BASE BUILDING CEILING MATERIAL & FINISHES. DEPARTMENTAL REPRESENTATIVE TO CONFIRM AGREED UPON ALLOWANCES DURING TENDERING OF WORK AND AWARD OF CONSTRUCTION CONTRACT.

REFLECTED CEILING SPECIFIC NOTES

- NEW SUSPENDED CEILING TO BE INSTALLED AT 2540MM A.F.F.
- CONTRACTOR TO CONSTRUCT NEW BULKHEAD AT EXISTING EXTERIOR WINDOW. REFER TO DETAIL 2 ON THIS PAGE.
- DEMOLISH EXISTING PLASTER CEILING TO COMPLETE MODIFICATIONS TO PLUMBING SERVICES FROM FLOOR ABOVE AS REQUIRED. CEILING TO BE REPAIRED UPON COMPLETION WITH NEW DRYWALL CEILING. ENSURE ALL PENETRATIONS THROUGH WALLS AND FLOOR SLABS MAINTAIN THE EXISTING FIRE SEPARATION RATING.

POWER/VOICE/DATA LEGEND

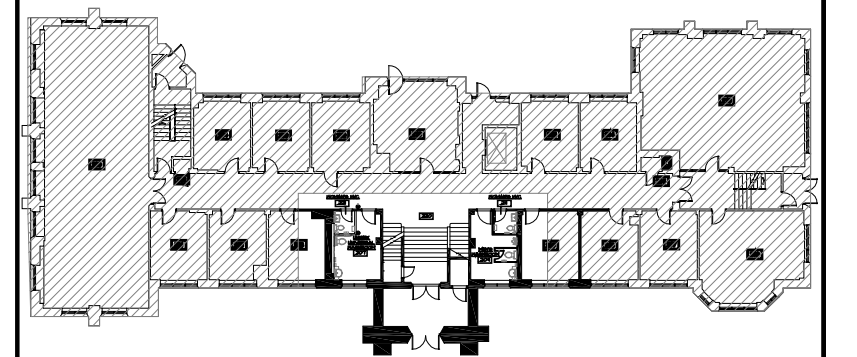
	EXISTING MAIN SWITCH TO BE REMOVED AND RELOCATED. REFER TO ELECTRICAL ENGINEERING DRAWINGS FOR FURTHER DETAIL.
	EXISTING STANDARD WALL MOUNTED DUPLEX OUTLET TO BE REMOVED. REFER TO ELECTRICAL ENGINEERING DRAWINGS FOR FURTHER DETAIL.
	EXISTING STANDARD WALL MOUNTED DATA OUTLET TO BE REMOVED. REFER TO ELECTRICAL ENGINEER'S DRAWINGS FOR FURTHER DETAIL.
	NEW STANDARD WALL MOUNTED DUPLEX OUTLET MOUNTED AT 405MM O.C. A.F.F. UNLESS OTHERWISE INDICATED. REFER TO ELECTRICAL ENGINEER'S DRAWINGS FOR SPECIFICATIONS AND LOCATION.
	INDICATES OUTLETS MOUNTED AT 118MM O.C. A.F.F. USED ABOVE 1830MM HIGH COUNTERS. REFER TO ELEVATIONS AND MILLWORK DRAWINGS.
	INDICATES AUTOMATIC DOOR OPERATOR PUSH PAD/DLE. REFER TO ENGINEER'S DRAWINGS FOR MORE INFORMATION.
	EMERGENCY CALL BUTTON REFER TO ENGINEER'S DRAWINGS FOR MORE INFORMATION.

POWER/VOICE/DATA GENERAL NOTES

- THIS DRAWING IS FOR LOCATION AND TYPE OF SERVICE OUTLETS ONLY AND MUST BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS INCLUDING OTHER CONSULTANT'S DRAWINGS. ANY DISCREPANCIES BETWEEN INTERIOR DESIGN DRAWINGS, ELECTRICAL DRAWINGS AND/OR AUDIO VISUAL DRAWINGS MUST BE REPORTED TO THE DESIGNER FOR CLARIFICATION DURING THE TENDER PROCESS FOR CLARIFICATION AND/OR ADJUSTMENTS PRIOR TO CONSTRUCTION.
- THIS DRAWING IS FOR ELECTRICAL AND TELEPHONE OUTLET LOCATION ONLY. REFER TO ELECTRICAL CONSULTANT'S DRAWINGS FOR WIRING, SCHEMATICS, PANELS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL ELECTRICAL WORK SHOWN ON THE ENGINEER'S DRAWINGS. ALL WORK TO BE APPROVED BY ONTARIO HYDRO, THE DEPARTMENTAL REPRESENTATIVE AND ANY OTHER AUTHORITIES HAVING JURISDICTION (I.E. CITY OF OTTAWA).
- FOR EXACT LOCATION OF ELECTRICAL OUTLETS INTEGRATED WITHIN OR ADJACENT TO MILLWORK, REFER TO APPLICABLE INTERIOR DESIGN MILLWORK DRAWINGS.
- ALL DUPLEX ELECTRICAL, VOICE/DATA OUTLETS TO BE STAGGERED 4" WHEN INSTALLED BOTH SIDES OF PARTITIONS.
- ALL DUPLEX ELECTRICAL, VOICE/DATA OUTLETS WHEN SHOWN SIDE BY SIDE ON PLAN, TO BE GANGED BEHIND COMMON FACE PLATE OR IF NOT POSSIBLE, THEN INSTALLED SIDE BY SIDE ALLOWING FOR MINIMUM SPACING BETWEEN COVER PLATES AND ALIGNED WITH ONE ANOTHER ON THE WALL. CONTRACTOR TO ADVISE DEPARTMENTAL REPRESENTATIVE OF ANY CONCERNS OR DISCREPANCIES AND APPROVAL PRIOR TO ORDERING COVER PLATES AND FINAL INSTALLATION.
- ALL TELEPHONE AND DUPLEX COVER PLATES, DIMMER SWITCHES AND EMERGENCY LIGHTS TO BE WHITE UNLESS OTHERWISE NOTED. EXISTING COVER PLATES THAT ARE NOT WHITE ARE TO BE REPLACED WITH NEW WHITE COVER PLATES. CONTRACTOR TO ADVISE DEPARTMENTAL REPRESENTATIVE OF ANY CONCERNS OR DISCREPANCIES AND APPROVAL PRIOR TO ORDERING COVER PLATES AND FINAL INSTALLATION.
- SMOKE DETECTORS, FIRE ALARMS, EXIT SIGNS, ETC. AS REQUIRED BY CODE MUST BE PROVIDED BY THE CONTRACTOR AND/OR IF EXISTING BUT REQUIRE RELOCATION MUST ALSO BE DONE BY CONTRACTOR. REFER TO ELECTRICAL ENGINEER'S DRAWINGS.
- CONTRACTOR TO ENSURE THAT NO SMOKE DETECTORS, FIRE ALARMS, EXIT SIGNS, THERMOSTATS OR LIGHT SWITCHES ETC. ARE LOCATED ON THE CENTER OF ANY WALL (DUE TO ART WORK), CONTACT DESIGNER IF THERE ARE ANY DISCREPANCIES.
- GENERAL CONTRACTOR TO ENSURE ALL SYSTEMS FURNITURE WHIPS ARE CUT DOWN ON SITE AFTER INSTALLATION OF SYSTEMS FURNITURE IS COMPLETE. WHIP LENGTH TO BE DETERMINED BY DESIGNER.
- WHERE FURNITURE INSTALLATION OCCURS, CONTRACTOR TO CONSULT DESIGNER AND/OR ENGINEER TO ENSURE THAT NO EQUIPMENT WILL INTERFERE WITH INSTALLATION (I.E. SMOKE DETECTORS, FIRE ALARMS, EXIT SIGNS, THERMOSTATS, LIGHT SWITCHES, ETC.)
- ALL PLUGS LOCATED IN ENCLOSED SPACES (OFFICE, MEETING ROOMS, ECT) TO BE MOUNTED ON CENTER OF WALL AT 16" A.F.F. UNLESS OTHERWISE NOTED OR DIMENSIONED.
- THE DEPARTMENTAL REPRESENTATIVE IS RESPONSIBLE FOR ALL CABLING, COMMUNICATION AND SECURITY ASSOCIATED WITH THE PROJECT. THE DEPARTMENTAL REPRESENTATIVE MUST PROVIDE SPECIFICATIONS FOR ALL AUDIOVISUAL EQUIPMENT FOR DESIGNER COORDINATION PRIOR TO THE TENDERING OF DESIGN DRAWINGS.

POWER/VOICE/DATA SPECIFIC NOTES

- SUPPLY AND INSTALL NEW AUTOMATIC DOOR OPERATOR AND NEW PUSH PLATES (SURFACE MOUNTED ON CORRIDOR WALLS ONLY) ON BOTH SIDES OF EXISTING DOOR 1402. REFER TO ENGINEER'S DRAWINGS FOR MORE INFORMATION.
- SUPPLY AND INSTALL NEW OCCUPANCY SENSORED LIGHT SWITCH CONFORMING TO THE LATEST EDITION OF THE ONTARIO BUILDING CODE. REFER TO ENGINEER'S DRAWINGS FOR MORE INFORMATION.
- SUPPLY AND INSTALL NEW EMERGENCY CALL BUTTON (SURFACE MOUNTED ON CORRIDOR WALLS ONLY) CONFORMING TO THE LATEST EDITION OF THE ONTARIO BUILDING CODE. REFER TO ENGINEER'S DRAWINGS FOR MORE INFORMATION.



KEY PLAN

3	11/22/2015	Issued for Tender
2	11/03/2015	Issued for Tender
1	10/30/2015	Issued for 49% review

NO.	DATE	REVISION
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THE CONTRACTOR IS TO VERIFY DIMENSIONS AND DATA NOTED HERE-IN WITH CONDITIONS ON THE SITE AND IS HELD RESPONSIBLE FOR REPORTING ANY DISCREPANCIES TO THE DESIGNERS FOR ADJUSTMENT.

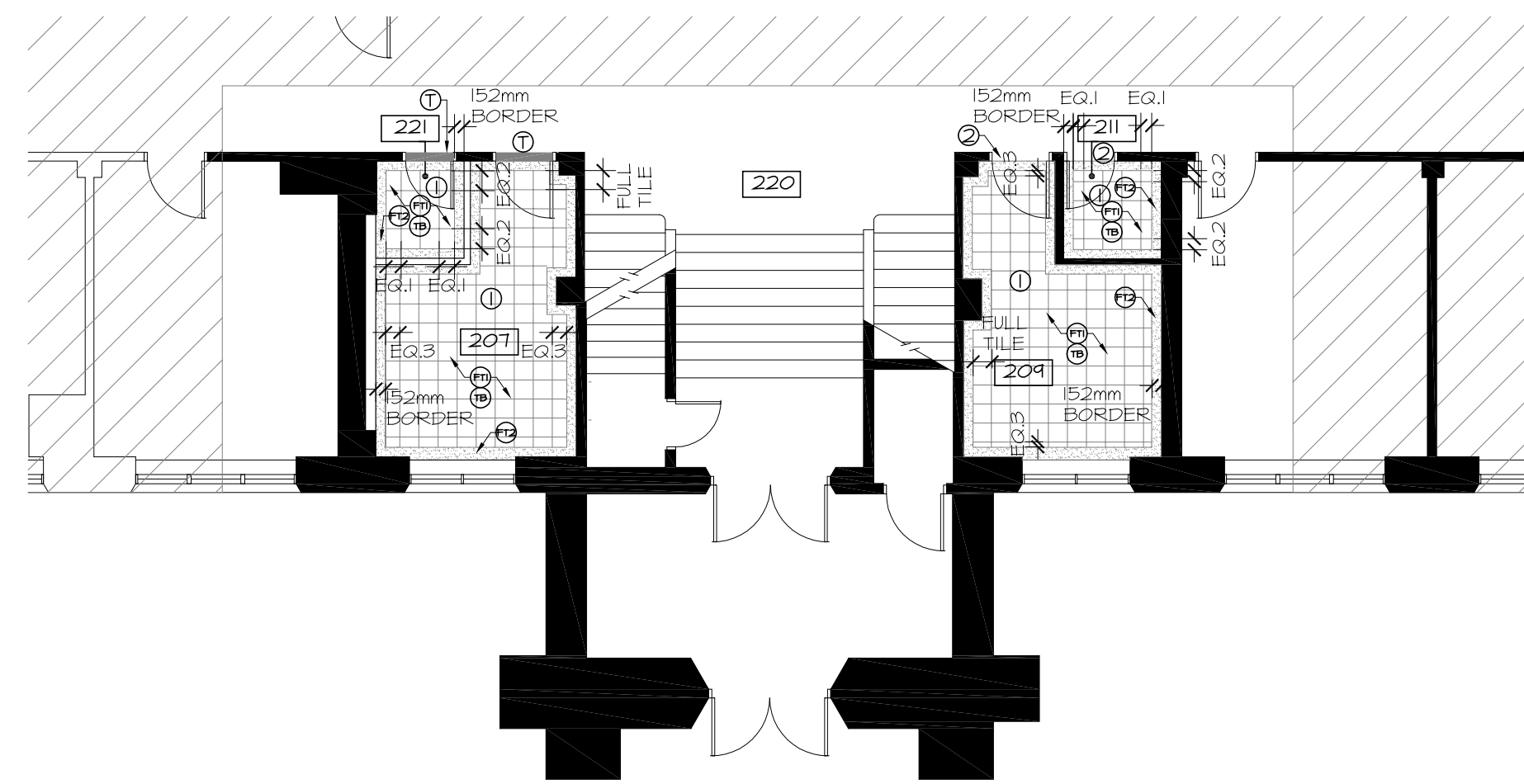
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B	LOCATION ON DRAWING NO.	B
C	DRAWING NUMBER	C

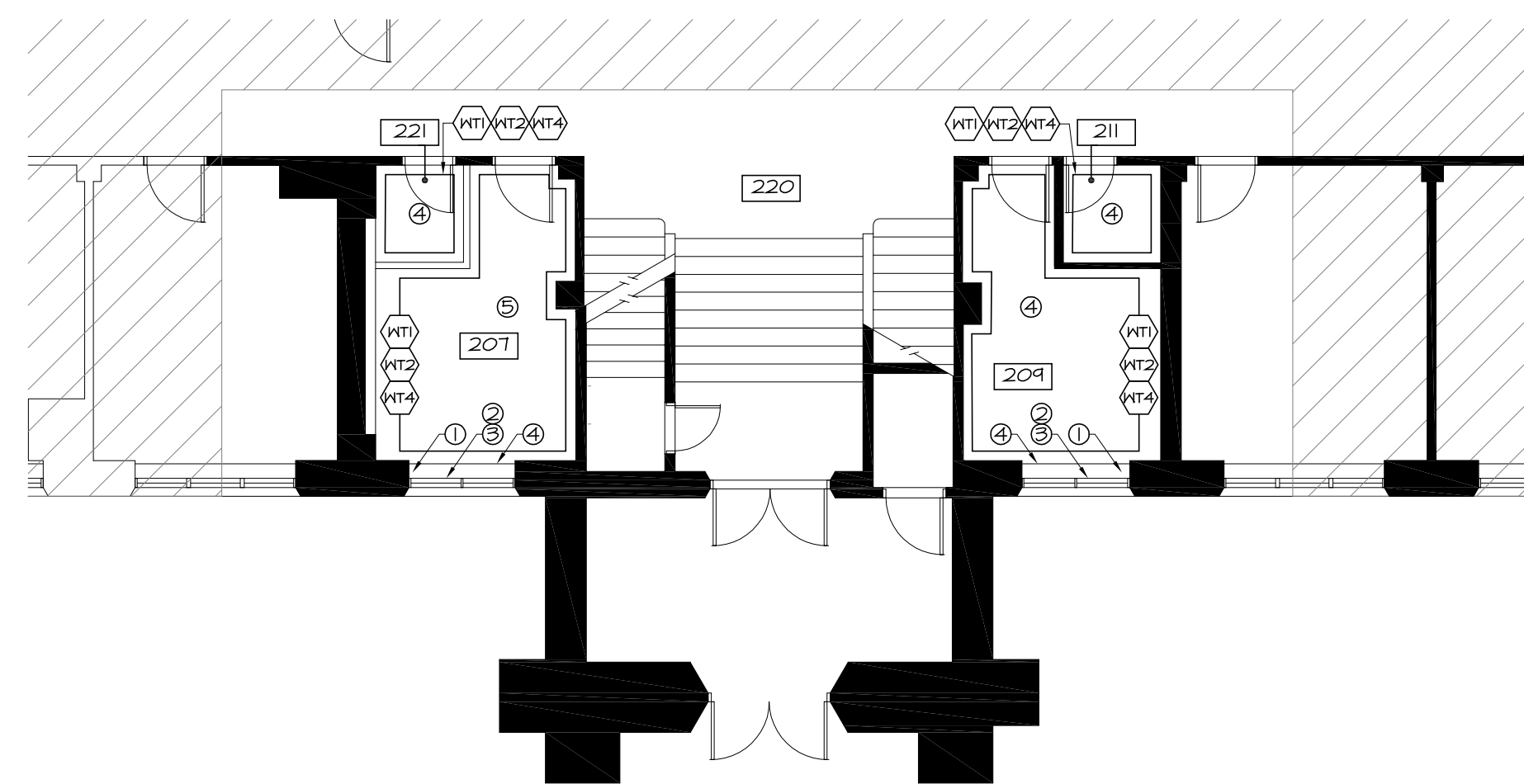
PROJECT  
AGRICULTURE AND AGRI  
FOOD CANADA  
BUILDING 49  
CENTRAL EXPERIMENTAL FARM

DRAWING TITLE  
REFLECTED  
CEILING AND VOICE  
DATA AND POWER PLAN  
GROUND FLOOR

SCALE AS NOTED	DRAWN BY EG	DESIGNED BY EG/AH
DATE OCTOBER 1, 2015	CHECKED BY SAS	
PROJECT NO. A654	DRAWING NO. ID-3	



1 FLOOR FINISHES PLAN  
SCALE: 1:100



2 WALL FINISHES PLAN  
SCALE: 1:100

FLOOR FINISHES LEGEND	
(FT)	TILE FLOORING - FIELD (BEIGE SPECKLE) MATERIAL: UNGLAZED PORCELAIN FINISH: MATTE COLOUR: SAND WITH SMALL GREY SPECKLE SIZE: 305mm X 305mm GROUT: BEIGE
(FTZ)	TILE FLOORING PERIMETER ACCENT BAND (BLACK) MATERIAL: PORCELAIN FINISH: POLISHED COLOUR: JET BLACK SIZE: 152mm X 610mm (PERIMETER BORDER) GROUT: CHARCOAL GREY NOTE: TILE TO BE SEALED WITH APPROPRIATE TILE SEALER
(TB)	TILE WALL BASE - 152MM HIGH (BLACK) MATERIAL: PORCELAIN FINISH: POLISHED COLOUR: JET BLACK SIZE: 152mm X 610mm GROUT: CHARCOAL GREY NOTE: TILE TO BE SEALED WITH APPROPRIATE TILE SEALER
(T)	NEW STONE THRESHOLD SIZE AND COLOUR TO MATCH EXISTING.

FLOOR FINISHES GENERAL NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER INTERIOR DESIGN DRAWINGS INCLUDING OTHER CONSTRUCTION DRAWINGS. ANY DISCREPANCIES BETWEEN DRAWINGS MUST BE REPORTED TO THE DESIGNER DURING THE TENDER PROCESS FOR CLARIFICATIONS AND/OR ADJUSTMENTS PRIOR TO CONSTRUCTION COMMENCEMENT.
- CONTRACTOR TO VISIT SITE DURING TENDER PERIOD TO DETERMINE EXTENT OF TOPPING AND LEVELING OF CONCRETE SLAB AND TO MAKE READY TO RECEIVE NEW FLOORING, AS REQUIRED.
- CONTRACTOR TO INCLUDE IN THEIR SCOPE AND PRICE A QUOTATION FOR ALL PREPARATION REQUIRED TO ENSURE A COMPLETE AND SATISFACTORY FLOORING INSTALLATION WITH NO IMPERFECTIONS.
- CONTRACTOR TO PROTECT ALL FINISHED AND EXISTING FLOOR AREAS WITHIN SCOPE WITH 6MM POLYPROPYLENE POLYPROPYLENE FLOOR PROTECTION IS NOT TO BE REMOVED UNTIL COMPLETION OF WORK.
- CONTRACTOR TO ALIGN HEAVY DUTY CARDBOARD AND/OR PLYWOOD SHEETS TO COVER AND PROTECT NEWLY INSTALLED OR EXISTING TILE FLOORING.
- ALL DUPLICATE SAMPLES OF FLOORING MATERIALS AND ACCESSORIES ARE TO BE SUBMITTED TO THE DEPARTMENTAL REPRESENTATIVE FOR REVIEW AND APPROVAL WHEN THE CONSTRUCTION CONTRACT IS AWARDED. CONTRACTOR TO CONFIRM THAT ALL DELIVERIES WILL MEET CONSTRUCTION SCHEDULE AND ORDERED FOLLOWING APPROVAL IS PROVIDED BY THE DESIGNER. SUBSTITUTIONS WILL NOT BE ACCEPTED DUE TO LATE ORDERING. IN THE EVENT THAT MATERIALS ARE NOT AVAILABLE IN TIME TO MEET CONSTRUCTION COMPLETION DATES, THE CONTRACTOR SHALL PROVIDE PROOF OF DATE OF ORDER OF MATERIALS PRIOR TO REQUESTING SUBSTITUTIONS BY THE DESIGNER.
- THE GENERAL CONTRACTOR SHALL INSTALL AND CLEAN READY FOR MOVE DATE ALL NEW FLOOR FINISHES AS PER MANUFACTURERS INSTALLATION SPECIFICATIONS.
- ALL FLOORING MATERIALS TO BE INSTALLED PRIOR TO INSTALLATION OF BASE.
- RESERVED.
- CONCRETE FLOOR IS TO BE FEATHERED AS REQUIRED DUE TO CHANGE IN FLOORING MATERIAL TO MINIMIZE TRANSITION AND ENSURE A PROPER INSTALLATION OF FLOORING MATERIALS AND TRANSITION STRIPS.
- ALL NEW TILE INSTALLATIONS TO RECEIVE EPOXY GROUT FOR DURABILITY & SANITARY CONCERNS. CONTRACTOR TO ADVISE DESIGNER IF THIS TYPE OF GROUT IS NOT RECOMMENDED IN CERTAIN TILE INSTALLATIONS.
- CONTRACTOR TO ENSURE THAT PROPER DOOR MOVEMENT IS ACHIEVED FOLLOWING INSTALLATION OF NEW FLOOR FINISHES AND BASE.
- CONTRACTOR TO SUPPLY THE DEPARTMENTAL REPRESENTATIVE WITH AGREED UPON PERCENTAGE OF FLOORING OVERAGE (ON TOP OF PROJECT REQUIREMENT SPECIFIED) OF ALL NEW FLOORING FINISHES AND BASE (ON ALL RELATED INSTALLATION MATERIALS). CONTRACTOR TO CONFIRM OVERAGE QUANTITIES AGREED TO WITH DEPARTMENTAL REPRESENTATIVE.
- CONTRACTOR TO INSTALL EXISTING WALL COVERING AND BASEBOARD AS APPLICABLE TO MATCH EXISTING IF SUITE ENTRY OR EXIT DOORS ARE RELOCATED.
- IF DOOR AND DOOR FRAME INSTALLATION IS AFFECTED DIRECTLY BY UNEVEN CONCRETE FLOOR SLAB, CONTRACTOR TO MAKE LEVEL USING CEMENTIOUS GROUT OR APPROPRIATE LEVELING METHODS.

FLOOR FINISHES SPECIFIC NOTES

- CONTRACTOR RESPONSIBLE FOR ENSURING EXISTING FLOOR SLAB IS MADE SMOOTH AND READY TO RECEIVE NEW FLOOR FINISH.
- EXISTING DOOR THRESHOLD TO REMAIN.

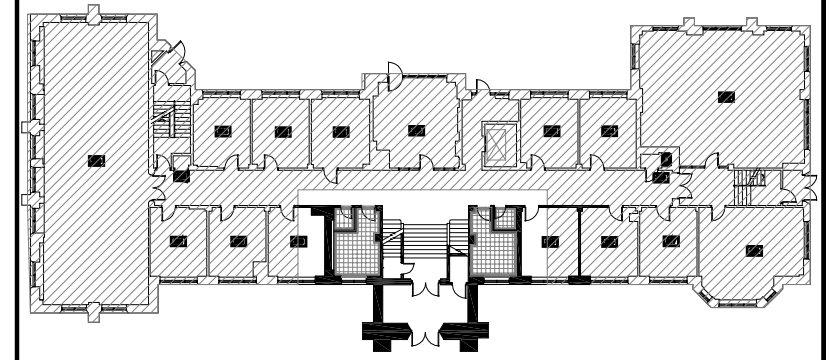
WALL FINISHES LEGEND	
(P1)	FIELD PAINT (WHITE) ALL WALLS TO BE PAINTED P1 UNLESS OTHERWISE NOTED. COLOUR: ALABASTER OFF WHITE FINISH: EGGSHELL
(MT)	WALL TILE FIELD (BEIGE) MATERIAL: GLAZED WALL TILE FINISH: MATTE SIZE: 152mm x 152mm COLOUR: OFF WHITE/BEIGE GROUT: BEIGE BUSHED STAINLESS STEEL EDGE TRIM AT EXPOSED EDGES REFER TO TYPICAL WALL ELEVATION ID-6
(MTZ)	WALL TILE ACCENT BAND (LIGHT BROWN) MATERIAL: GLAZED WALL TILE FINISH: MATTE SIZE: 152mm x 152mm COLOUR: LIGHT BROWN GROUT: BEIGE REFER TO TYPICAL WALL ELEVATION ID-6
(MT4)	WALL TILE ACCENT (BLACK) MATERIAL: PORCELAIN FINISH: MATTE SIZE: 5mm x 5mm MOSAIC COLOUR: BLACK GROUT: CHARCOAL GREY REFER TO TYPICAL WALL ELEVATION ID-6

WALL FINISHES GENERAL NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER INTERIOR DESIGN DRAWINGS INCLUDING OTHER CONSTRUCTION DRAWINGS. ANY DISCREPANCIES BETWEEN DRAWINGS MUST BE REPORTED TO THE DESIGNER DURING THE TENDER PROCESS FOR CLARIFICATIONS AND/OR ADJUSTMENTS PRIOR TO CONSTRUCTION COMMENCEMENT.
- CONTRACTOR TO VISIT SITE DURING TENDER PERIOD TO DETERMINE EXTENT OF TOPPING AND LEVELING OF CONCRETE SLAB AND TO MAKE READY TO RECEIVE NEW WALL FINISHES, AS REQUIRED.
- ALL MATERIALS ARE TO BE ORDERED WHEN THE CONSTRUCTION CONTRACT IS AWARDED. AT THIS TIME THE CONTRACTOR IS TO CONFIRM THAT ALL DELIVERIES WILL MEET CONSTRUCTION SCHEDULE COMPLETION DATES. THE CONTRACTOR SHALL PROVIDE PROOF OF DATE FOR ORDER OF MATERIALS PRIOR TO REQUESTING SUBSTITUTIONS.
- THE CONTRACTOR SHALL PROVIDE CONTROL SAMPLES FOR APPROVAL BY DEPARTMENTAL REPRESENTATIVE OF ALL NEW PAINTS & WALL FINISHES SPECIFIED. 12" x 12" SAMPLES TO BE TAGGED ACCORDING TO PAINT FINISHES LEGEND. ALL PAINT SAMPLES SHALL BE APPROVED BY DEPARTMENTAL REPRESENTATIVE PRIOR TO APPLICATION.
- UNLESS OTHERWISE NOTED, ALL EXISTING SURFACES WHERE INDICATED AND NEW PAINTED PARTITIONS TO BE FINISHED AS FOLLOWS:  
PRIME WITH ONE COAT LATEX SEALER, SAND ALL SURFACES, REPAIR DEPRESSIONS, ETC. WITH DRYWALL COMPOUND. SPOT PRIME ALL PATCHED AREAS. SAND, APPLY ONE FINISH COAT PAINT (COLOUR AS SPECIFIED). AFTER COAT HAS DRIED, RE-SAND AND FINISH WITH ONE COAT PAINT (COLOUR AS SPECIFIED) UNLESS OTHERWISE INDICATED.
- EXCEPT WHERE OTHERWISE NOTED, PAINT FINISH FOR WALLS TO BE LATEX FINISH WITH 25 TO 35% SHEEN.
- ONCE PAINT HAS CURED, FINISHES TO BE DURABLE ENOUGH TO ENABLE CLEANING OF FINGER MARKS AND MINOR SCUFFING WITHOUT DISTURBING THE ORIGINAL PAINT SHEEN. PAINT REQUIRES 45 DAYS TO CURE PRIOR TO CLEANING.
- ALL DARK COLOURS ARE TO RECEIVE MINIMUM 3 COATS OF PAINT TO ENSURE PROPER COVERAGE OF THE PARTITIONS, DOOR SLABS AND DOOR FRAMES.
- CONTRACTOR TO USE ENVIRONMENTALLY FRIENDLY, NON-TOXIC WATER BASED PAINTS WITH NO VOC'S OR FAST OUT-GAS CHARACTERISTICS. LOW VOC WATER BASED PAINT WITH LOW SHEEN FINISH.
- PAINTER IS RESPONSIBLE TO ENSURE APPROPRIATE PRIMER/PAIN IS APPLIED BASED ON SURFACE TO BE PAINTED.
- ALL GYPSUM BOARD CEILING TO BE PAINTED WHITE UNLESS OTHERWISE NOTED. REFER TO WALL FINISHES LEGEND.

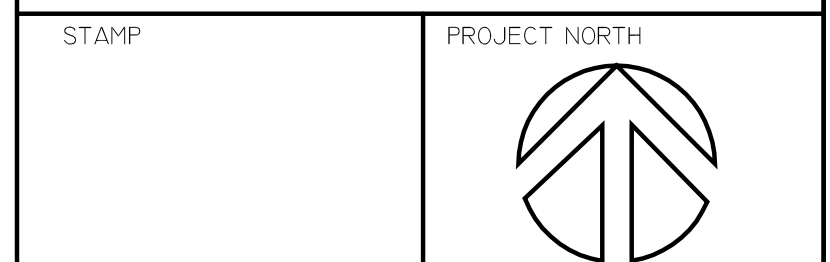
WALL FINISHES SPECIFIC NOTES

- SAND AND REPAIR EXISTING WOOD WINDOW SILL TO MATCH EXISTING WINDOW TRIM AND FRAMING.
- EXISTING WINDOW TRIM AND FRAMING TO REMAIN AS IS. CONTRACTOR TO CLEAN AS REQUIRED.
- NEW MAT CRYSTAL WINDOW FILM TO BE APPLIED TO THE INSIDE FACE OF EXTERIOR VERTICALLY SLIDING WINDOW. WINDOW FILM TO BE INSTALLED ON LOWER WINDOW ONLY. FILM TO CONGEAL DETAIL BUT ALLOW LIGHT THROUGH.
- CONVECTOR HEATING COVER TO BE PAINTED WITH SEMI-GLOSS ELECTROSTATIC ENEMAL PAINT IN P1 COLOUR.
- REFER TO ELEVATIONS ON ID-6 FOR WALL TILE LAYOUT DETAILS.



NO.	DATE	REVISION
3	11/22/2015	Issued for Tender
2	11/03/2015	Issued for Tender
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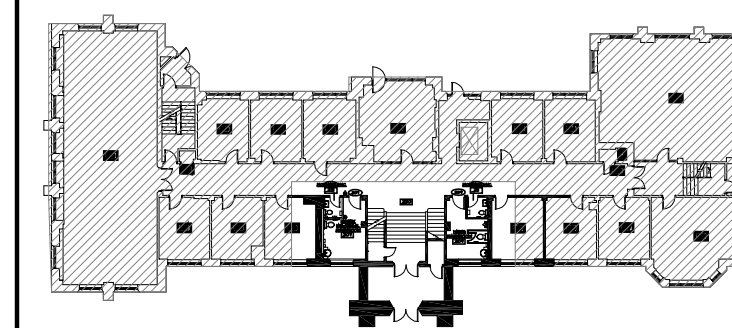


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B	LOCATION ON DRAWING NO.	B
C	DRAWING NUMBER	C

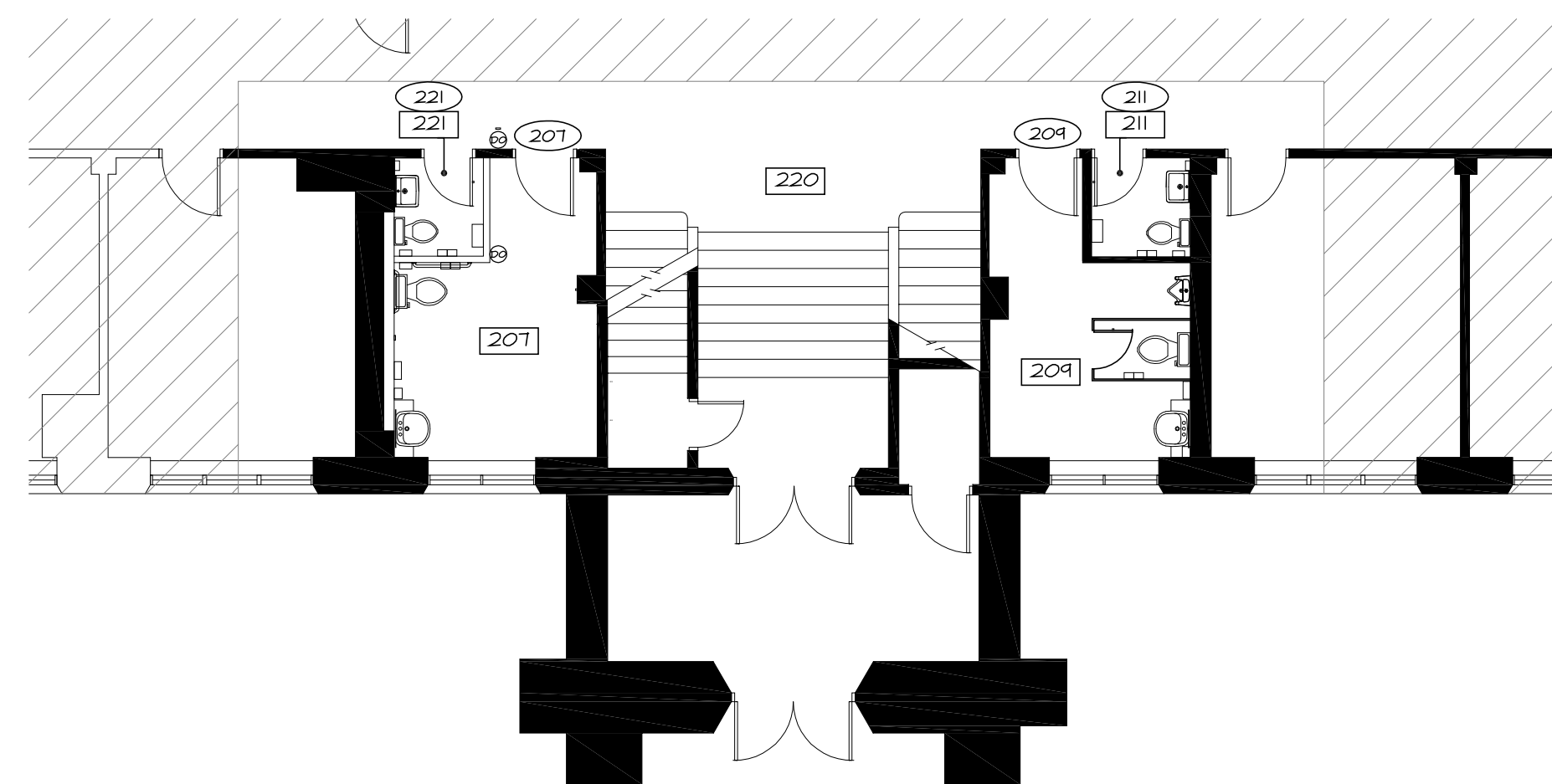
PROJECT  
AGRICULTURE AND AGRICULTURE AND AGRICULTURE  
FOOD CANADA  
BUILDING 49  
CENTRAL EXPERIMENTAL FARM

DRAWING TITLE  
FLOOR AND WALL  
FINISHES PLAN  
GROUND FLOOR

SCALE AS NOTED	DRAWN BY EG	DESIGNED BY EG/AH
DATE OCTOBER 1, 2015	CHECKED BY SAS	
PROJECT NO. A654	DRAWING NO. ID-4	



KEY PLAN



1 DOOR PLAN  
ID-5 SCALE: 1:100

DOOR AND HARDWARE SCHEDULE

DOOR NUMBER	LOCATION	DOOR				FRAME				ELEVATION	FIRE RATING	HARDWARE PACKAGE	SPECIFIC NOTES
		ELEVATION/DOOR TYPE	EXISTING/REUSE/NEW	SIZE	MATERIAL	FINISH	ELEVATION/FRAME TYPE	EXISTING/REUSE/NEW	MATERIAL				
211	EXISTING WOMEN'S WASHROOM	ETR	ETR	1625MM	45MM	KV	S	THE	N	KF	S	#1	
209	EXISTING MEN'S WASHROOM	ETR	ETR	1625MM	45MM	KV	S	THE	N	KF	S	#2	
207	NEW UNISEX UNIVERSAL WASHROOM	A	N	914MM	5V	45MM	KV	S	---	---	---	#3	NEW DOOR TO MATCH #209. EXISTING FRAME TO REMAIN. AUTOMATIC DOOR OPERATOR & CONTROLS. NO GLASS PANEL REQUIRED.
221	NEW WOMEN'S WASHROOM	A	N	1625MM	45MM	KV	S	---	---	---	---	#4	NEW DOOR & FRAME TO MATCH ADJACENT DOOR #211. NO GLASS PANEL REQUIRED.

LEGEND & ABBREVIATIONS

- KV - SOLID CORE WOOD VENEER DOOR TO MATCH ADJACENT DOOR #211
- KF - HARDWOOD FRAME TO MATCH ADJACENT DOOR #211
- N - NEW
- ETR - EXISTING TO REMAIN
- THE - TO MATCH EXISTING
- S - WOOD STAIN FINISH
- SV - SITE VERIFY

DOOR AND HARDWARE NOTES

1. ALL STAINED WOOD DOORS AND FRAMES TO BE SHOP FINISHED.
2. ALL DOORS TO BE FINISHED AS PER DOOR AND FRAME SCHEDULE. ALL NEW AND EXISTING DOORS AND FRAMES TO PATCHED AND REPAIRED AS REQUIRED.
3. DOOR & FRAME STAIN COLOUR TO MATCH EXISTING. CONTRACTOR TO PROVIDE SAMPLES FOR APPROVAL BY DEPARTMENTAL REPRESENTATIVE PRIOR TO COMMENCING WORK.
4. ALL HARDWARE EXCEPT WHERE OTHERWISE NOTED TO BE NEW LEVER HANDLES AND BACK PLATES WITH BRASS FINISH. REFER TO DOOR AND HARDWARE SCHEDULE. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR REVIEW BY DEPARTMENTAL REPRESENTATIVE. ALL LOCKS TO BE KEYPED AS PER DEPARTMENTAL REPRESENTATIVE'S INSTRUCTIONS.
5. CONTRACTOR TO SITE VERIFY CEILING HEIGHT THROUGHOUT FLOOR TO ENSURE PROPER FIT OF ALL NEW DOORS.
6. CONTRACTOR IS RESPONSIBLE FOR ENSURING DOOR SWINGS COINCIDE WITH PARTITION PLAN.
7. ALL LOCKING LATCHSETS TO BE INSTALLED SO KEY LOCK IS ON OUTSIDE OF ROOM SIDE OF DOOR UNLESS OTHERWISE NOTED.
8. ALL WOOD DOORS TO HAVE SILENCERS.
9. ALL WOOD DOORS TO BE FINISHED ON ALL EXPOSED EDGES. TOP & BOTTOM SHOULD BE SEALED IN SHOP PRIOR TO DELIVERY.

HARDWARE PACKAGES

- PACKAGE #1 (PRIVACY)**
- REMOVE EXISTING KNOB HANDLE HARDWARE AND BACK PLATES
  - NEW BRASS PASSAGE FUNCTION LEVER LATCHSET C/W ONE SIDED DEADBOLT WITH "IN USE" INDICATOR AND BACK PLATE TO MATCH EXISTING SIZE
  - EXISTING HINGES TO REMAIN
  - NEW FLOOR MOUNTED DOOR STOP
  - NEW DOOR SILENCERS
  - NEW BRUSHED STAINLESS STEEL COAT HOOK
  - EXISTING WOMEN'S WASHROOM SIGN TO REMAIN
- PACKAGE #2 (PASSAGE)**
- REMOVE EXISTING KNOB HANDLE HARDWARE AND BACK PLATES
  - NEW 16MM X 254MM BRASS PUSH PLATE
  - NEW 16MM BRASS DOOR PULL WITH NEW 16MM X 254MM BRASS BACK PLATE
  - EXISTING HINGES TO REMAIN
  - NEW FLOOR MOUNTED DOOR STOP
  - EXISTING DOOR CLOSER TO REMAIN
  - NEW DOOR SILENCERS
  - EXISTING MEN'S WASHROOM SIGN TO REMAIN
- PACKAGE #3 (PRIVACY)**
- NEW BRASS PRIVACY FUNCTION LEVER LATCHSET C/W INSIDE PUSH LOCK AND OUTSIDE EMERGENCY KEY UNLOCK AND 16MM X 254MM BRASS BACK PLATE
  - REUSE EXISTING HINGES
  - NEW FLOOR MOUNTED DOOR STOP
  - NEW DOOR SILENCERS
  - NEW AUTOMATIC DOOR OPERATOR AND ASSOCIATED CONTROLS
  - NEW ELECTRIC STRIKE
  - NEW ACTUATOR
  - NEW RELAY
  - NEW DOOR CONTACT
  - NEW UNIVERSAL WASHROOM EMERGENCY CALL SYSTEM KIT TO INCLUDE:
    - EMERGENCY PUSH BUTTON
    - TRANSFORMER
    - TWO HORNS-STROBES
    - EMERGENCY ASSISTANCE SIGN (SEE ELEVATIONS)
    - CONNECTION DIAGRAM
    - POWERED "OCCUPIED" SIGN
  - NEW UNISEX WASHROOM DOOR SIGN TO MATCH EXISTING WASHROOM SIGNAGE
- PACKAGE #4 (PRIVACY)**
- NEW BRASS PASSAGE FUNCTION LEVER LATCHSET C/W ONE SIDED DEADBOLT WITH "IN USE" INDICATOR AND 16MM X 254MM BRASS BACK PLATE
  - NEW SOLID BRASS HEAVY DUTY HINGES 1/2 PAIR PER DOOR
  - NEW FLOOR MOUNTED DOOR STOP
  - NEW DOOR SILENCERS
  - NEW BRUSHED STAINLESS STEEL COAT HOOK
  - NEW WOMEN'S WASHROOM SIGN TO MATCH DOOR #211

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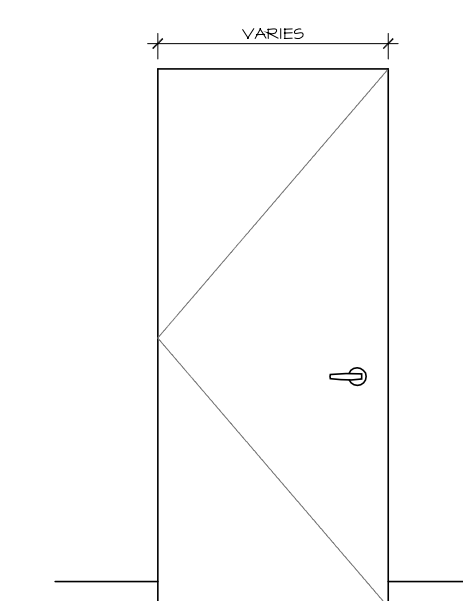
STAMP PROJECT NORTH

A A DETAIL NUMBER  
B B LOCATION ON DRAWING NO.  
C C DRAWING NUMBER

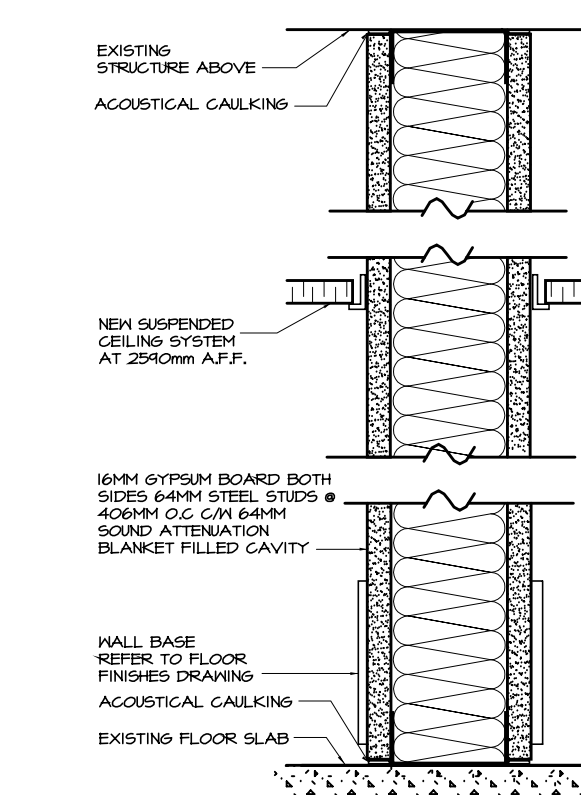


EXISTING DOOR #211

EXISTING DOOR #211 SHOWN FOR REFERENCE FOR NEW DOOR #207 AND #221. EXISTING FRAME AT #207 TO REMAIN AND BE REFINISHED TO MATCH #211. NEW FRAME #221 TO MATCH #211. NEW DOOR #207 AND #221 FINISH TO MATCH #211. NEW DOOR #221 HEIGHT TO MATCH DOOR #207.



DOOR TYPE A  
SCALE: 1:30



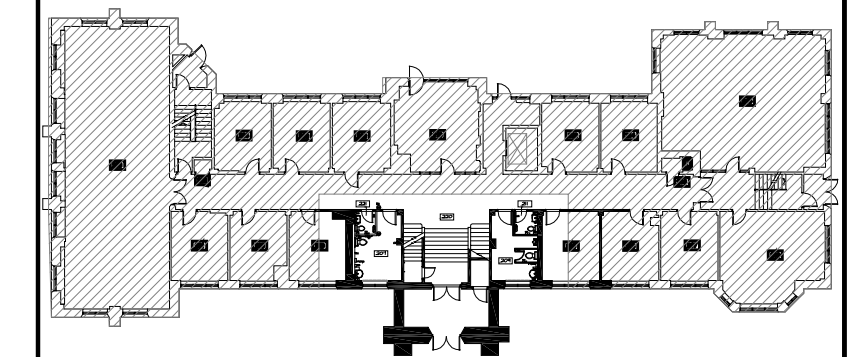
TYPE W/ PARTITION  
SCALE: NTS

PROJECT  
AGRICULTURE AND AGRICULTURE AND AGRI-FOOD CANADA  
BUILDING 49  
CENTRAL EXPERIMENTAL FARM

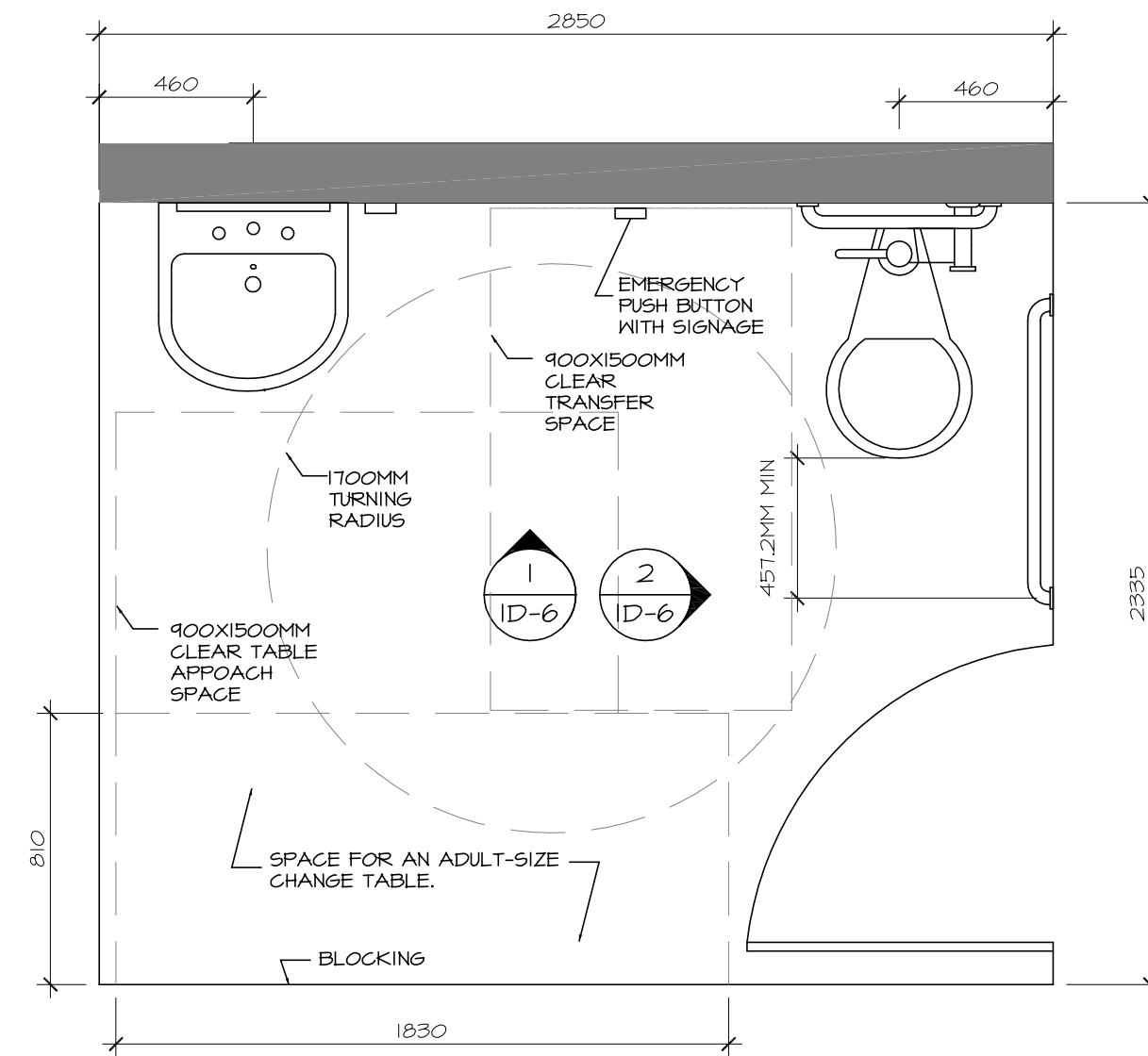
DRAWING TITLE  
DOOR, HARDWARE, AND WALL SECTION DETAILS

GROUND FLOOR

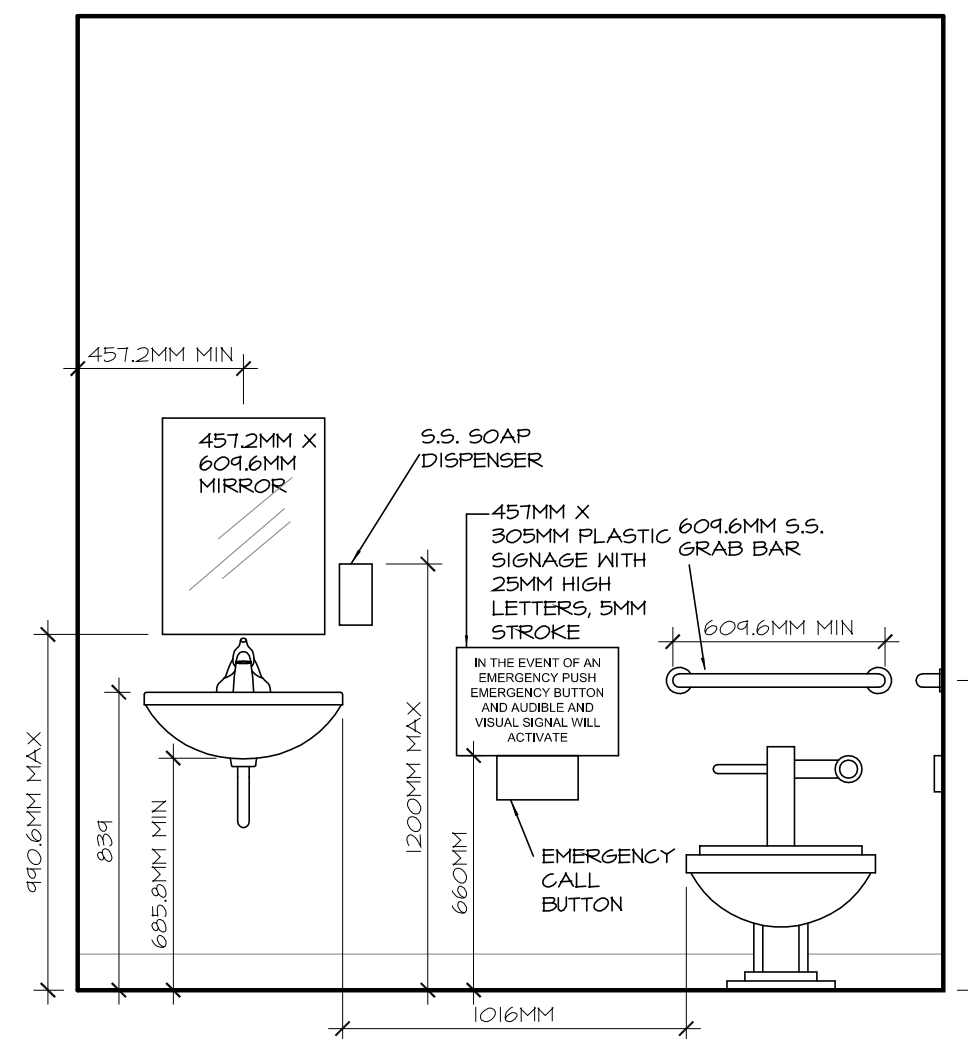
SCALE	DRAWN BY	DESIGNED BY
AS NOTED	EG	EG/AH
DATE	CHECKED BY	
OCTOBER 1, 2015	SAS	
PROJECT NO.	DRAWING NO.	
A654	ID-5	



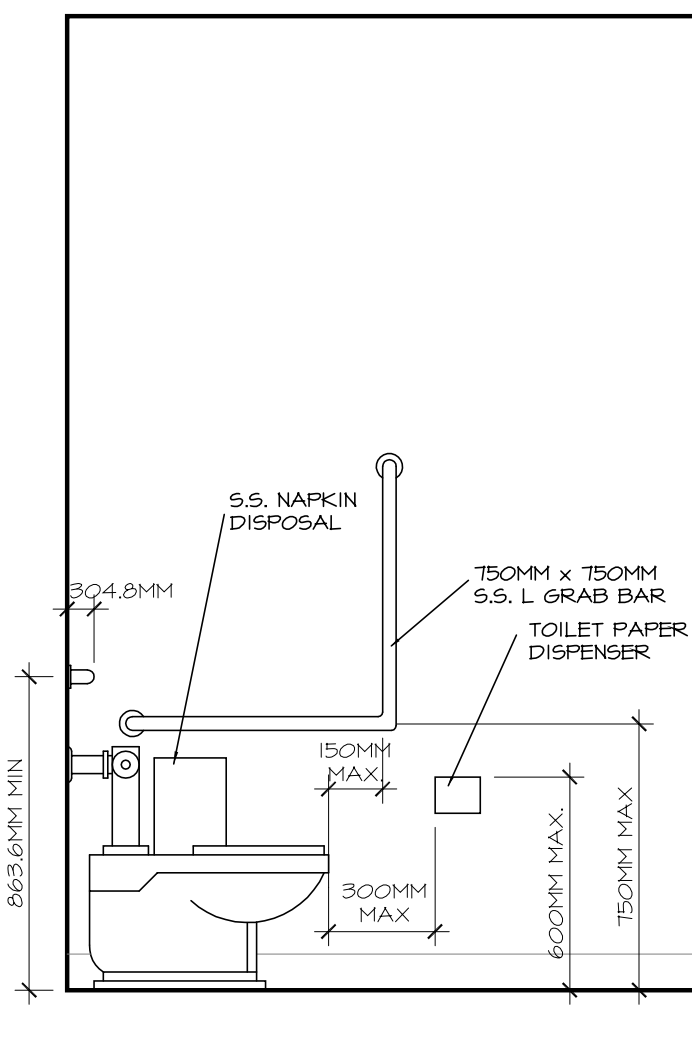
KEY PLAN



1 TYPICAL UNIVERSAL WASHROOM PLAN  
ID-6 SCALE 1:20



1 TYPICAL ELEVATION 1  
ID-6 SCALE 1:20



2 TYPICAL ELEVATION 1  
ID-6 SCALE 1:20

WALL FINISHES LEGEND	
PI	FIELD PAINT (WHITE) ALL WALLS TO BE PAINTED PI UNLESS OTHERWISE NOTED. COLOUR: ALABASTER OFF WHITE FINISH: EGGSHELL
NT	WALL TILE FIELD (BEIGE) MATERIAL: GLAZED WALL TILE FINISH: MATTE SIZE: 152mm x 152mm COLOUR: OFF WHITE/BEIGE GROUT: BRUSHED STAINLESS-STEEL TRIM AT EXPOSED EDGES REFER TO TYPICAL WALL ELEVATION ID-6
NT2	WALL TILE ACCENT BAND (LIGHT BROWN) MATERIAL: GLAZED WALL TILE FINISH: MATTE SIZE: 152mm x 152mm COLOUR: LIGHT BROWN GROUT: BEIGE REFER TO TYPICAL WALL ELEVATION ID-6
NT4	WALL TILE ACCENT (BLACK) MATERIAL: PORCELAIN FINISH: MATTE SIZE: 5mm x 5mm MOSAIC COLOUR: BLACK GROUT: CHARCOAL GREY REFER TO TYPICAL WALL ELEVATION ID-6

MILLWORK LAMINATE LEGEND	
LI	MILLWORK LAMINATE (BLACK) MATERIAL: PLASTIC LAMINATE COLOUR: BLACK MARBLE-LOOK FINISH: TEXTURED GLOSS

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1	10/30/2015	Issued for 49% review

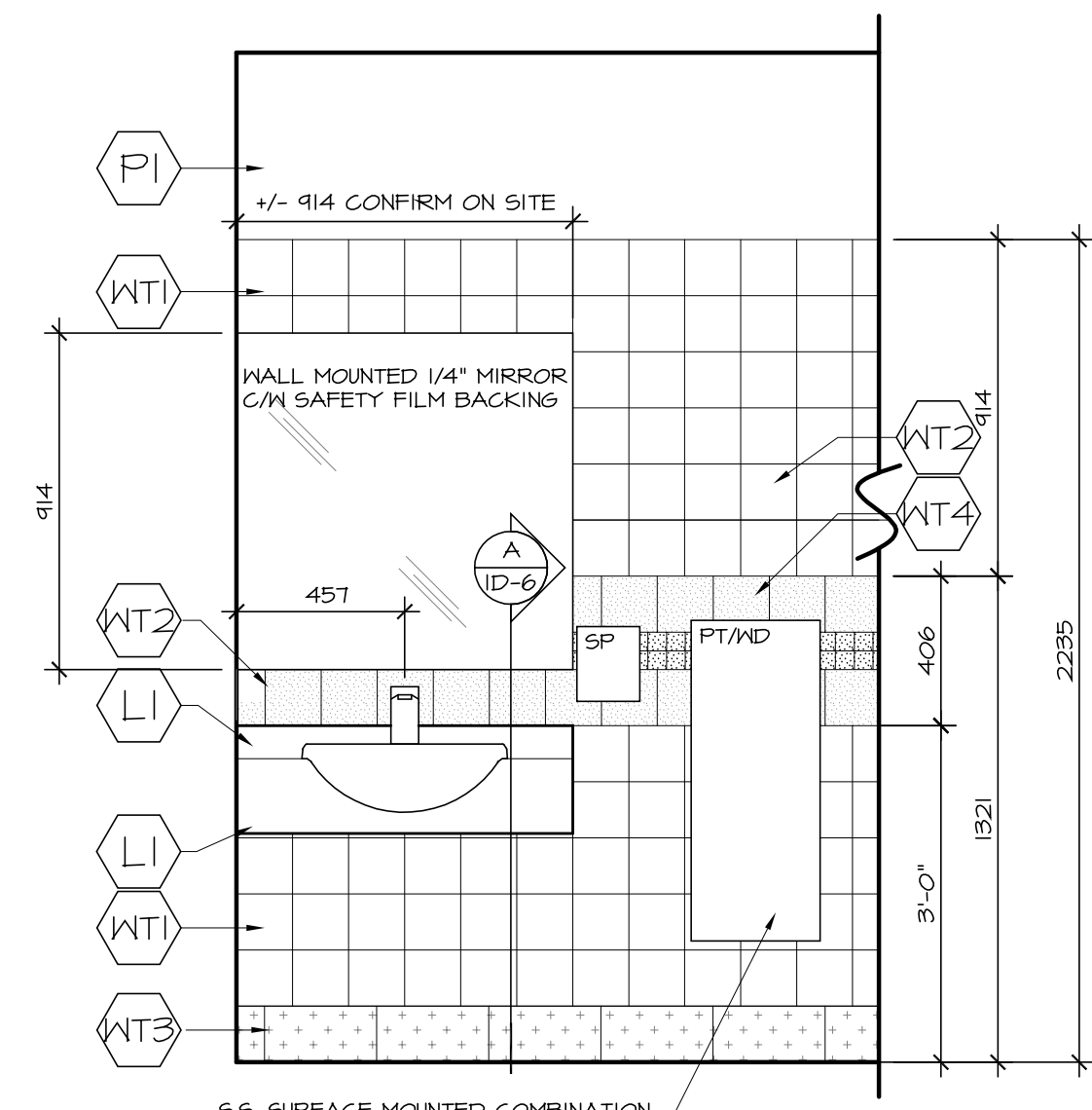
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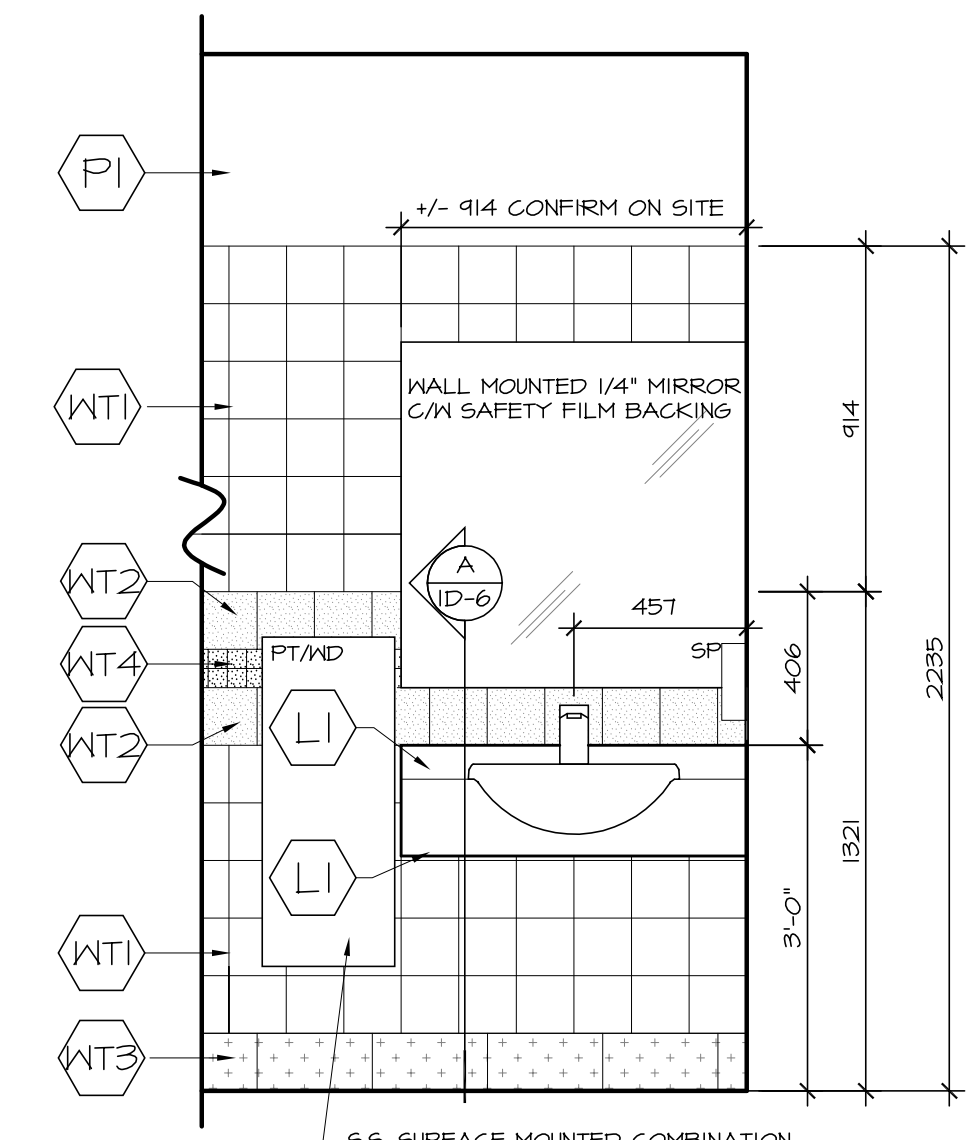
MILLWORK GENERAL NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT CONSTRUCTION DRAWINGS AND SPECIFICATIONS INCLUDING ALL THOSE BY MECHANICAL AND ELECTRICAL ENGINEERS, STRUCTURAL AND AUDIO VISUAL DRAWINGS, AS REQUIRED TO ENSURE PROPER COORDINATION AND INSTALLATION.
- ALL COUNTERS TO BE CONSTRUCTED WITH 3/4" PLYWOOD AND FINISHED WITH PLASTIC LAMINATE. REFER TO SPECIFIC DETAILS.
- CABINETS TO BE CONSTRUCTED OF 3/4" HIGH DENSITY PARTICLE BOARD C/W STANDARD WHITE MELAMINE FINISH UNLESS OTHERWISE INDICATED.
- SELVES TO BE CONSTRUCTED OF 3/4" HIGH DENSITY PARTICLE BOARD C/W STANDARD WHITE MELAMINE FINISH.
- ALL INTERIOR SURFACES OF DRAWERS, CABINETS AND ADJUSTABLE CAVITY TO SUPPORT NEAR MILLWORK AS REQUIRED.
- PROVIDE ADDITIONAL 1" PLYWOOD BLOCKING IN PARTITION WALL CAVITY TO SUPPORT NEAR MILLWORK AS REQUIRED.
- FRIDGE, MICROWAVE AND COFFEE MACHINE, ARE N.L.C. CONTRACTOR TO COORDINATE INSTALLATION WITH CLIENT.
- CABINET HINGES TO BE CONCEALED SPRING ACTION/SELF CLOSING TYPE TO SUIT CONDITIONS.
- ALL DRAWERS ON FULL EXTENSION HEAVY DUTY GLIDES WITH BUILT IN STOPS.
- ALL ADJUSTABLE SHELVES TO HAVE HOLES DRILLED 2" O.G. TO ACCEPT ADJUSTABLE METAL SHELF SUPPORT CLIPS.
- REFER TO MECHANICAL CONSULTANTS DRAWINGS FOR SINK SPECIFICATIONS.
- REPRODUCIBLE SHOP DRAWINGS TO BE PROVIDED FOR DEPARTMENTAL REPRESENTATIVE'S REVIEW PRIOR TO THE BEGINNING OF FABRICATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY SITE FOR ALL DIMENSIONS.
- ALL SELVES TO BE CONSTRUCTED TO WITHSTAND HEAVY PAPER LOADS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE ALL CUSTOM MILLWORK IS STRUCTURALLY STABLE AND TO REPORT ANY DISCREPANCIES FOUND PRIOR TO FABRICATION.
- CONTRACTOR TO ENSURE ALL SURFACES UNDER WORK COUNTER ARE SANDED SMOOTH TO PREVENT HARM TO CLOTHING.
- THE CONTRACTOR IS RESPONSIBLE TO VERIFY ON SITE FOR ALL DIMENSIONS, CONTRACTOR TO REPORT ALL DISCREPANCIES TO DESIGNER.
- THE CONTRACTOR SHALL PROVIDE CONTROL SAMPLES FOR APPROVAL BY DEPARTMENTAL REPRESENTATIVE OF ALL FINISHES (LAMINATES AND STAINS) SPECIFIED. 12"x12" SAMPLES TO BE TAGGED ACCORDING TO MILLWORK FINISHES LEGEND. ALL SAMPLES SHALL BE APPROVED BY THE DEPARTMENTAL REPRESENTATIVE PRIOR TO APPLICATION.
- ALL WOOD AND VENEER SHALL BE CONSISTENT IN QUALITY AND SHALL HAVE NO BURN / BLADE MARKS TO ENSURE ACCEPTANCE OF A CONSISTENT STAIN FINISH THROUGHOUT WITH NO LIGHT AND DARK VARIATIONS.
- THE CONTRACTOR'S SUB-TRADE SHALL ENSURE A CONSISTENT STAIN COLOUR AND FINISH ON BOTH HARDWOOD AND VENEER. THE QUANTITY OF COATS OF STAIN APPLIED IS THE RESPONSIBILITY OF THE SUB-TRADE TO ENSURE EXACT MATCH TO CONTROL SAMPLE.
- CONTRACTOR TO NOTIFY THE DESIGNER PRIOR TO THE FABRICATION OF SPECIFIED MILLWORK IF THE PROPOSED MILLWORK DRAWINGS WHEDE ACCESS TO ANY ELECTRICAL AND/OR MECHANICAL SYSTEMS WHEREBY ACCESS TO THESE SYSTEMS IS REQUIRED FOR REGULAR OPERATION AND/OR MAINTENANCE.

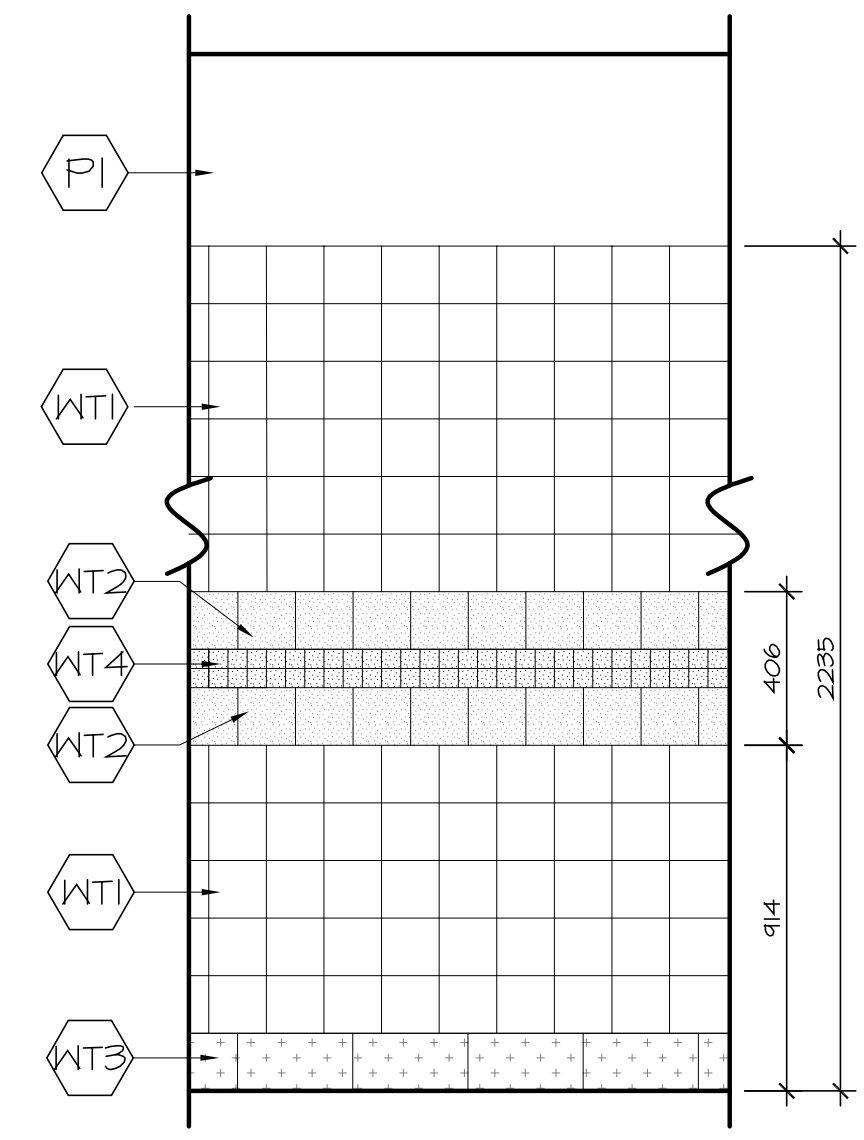
STAMP	PROJECT NORTH
A	A DETAIL NUMBER
B	B LOCATION ON DRAWING NO.
C	C DRAWING NUMBER



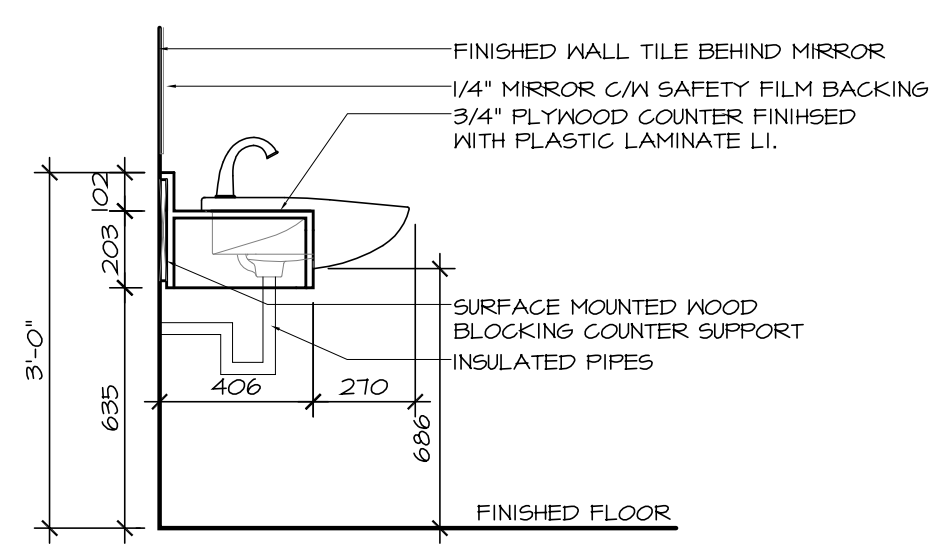
1 UNIVERSAL WASHROOM  
ID-2 SCALE 1:20



2 MEN'S WASHROOM  
ID-2 SCALE 1:20



3 TYPICAL WALL TILE ELEVATION  
ID-6 SCALE 1:20

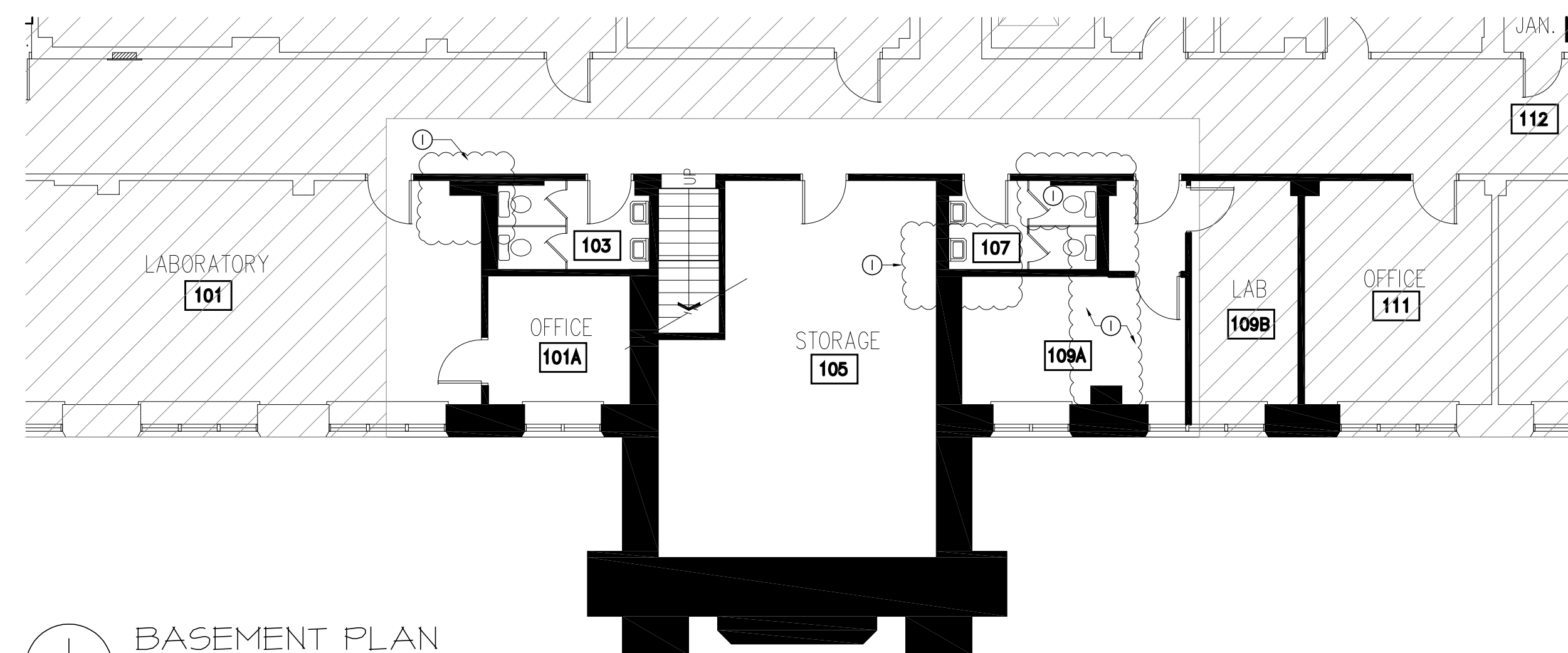


A MILLWORK DETAIL  
ID-6 SCALE 1:20

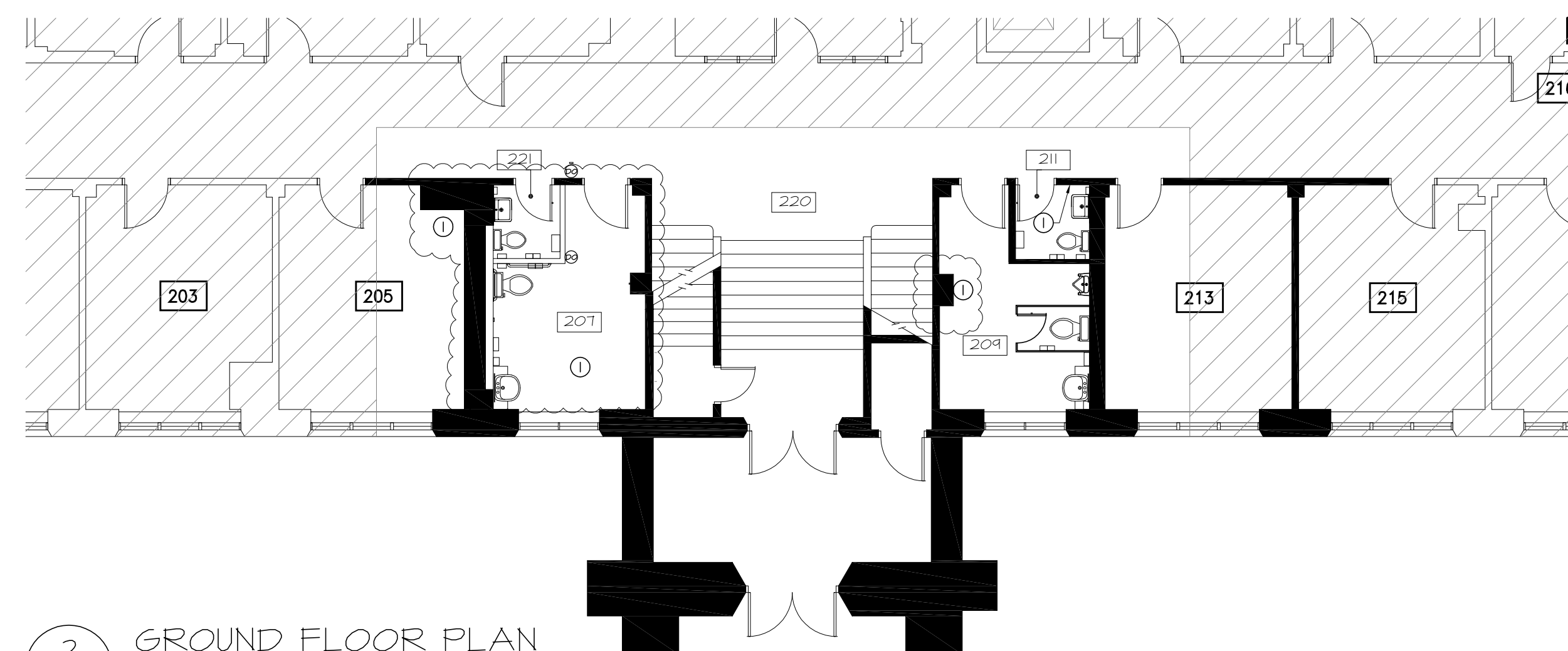
PROJECT  
AGRICULTURE AND AGRICULTURE  
FOOD CANADA  
BUILDING 49  
CENTRAL EXPERIMENTAL FARM

DRAWING TITLE  
ELEVATIONS, SECTIONS &  
DETAILS  
FLOOR (IF MULTI-FLOOR PROJECT)

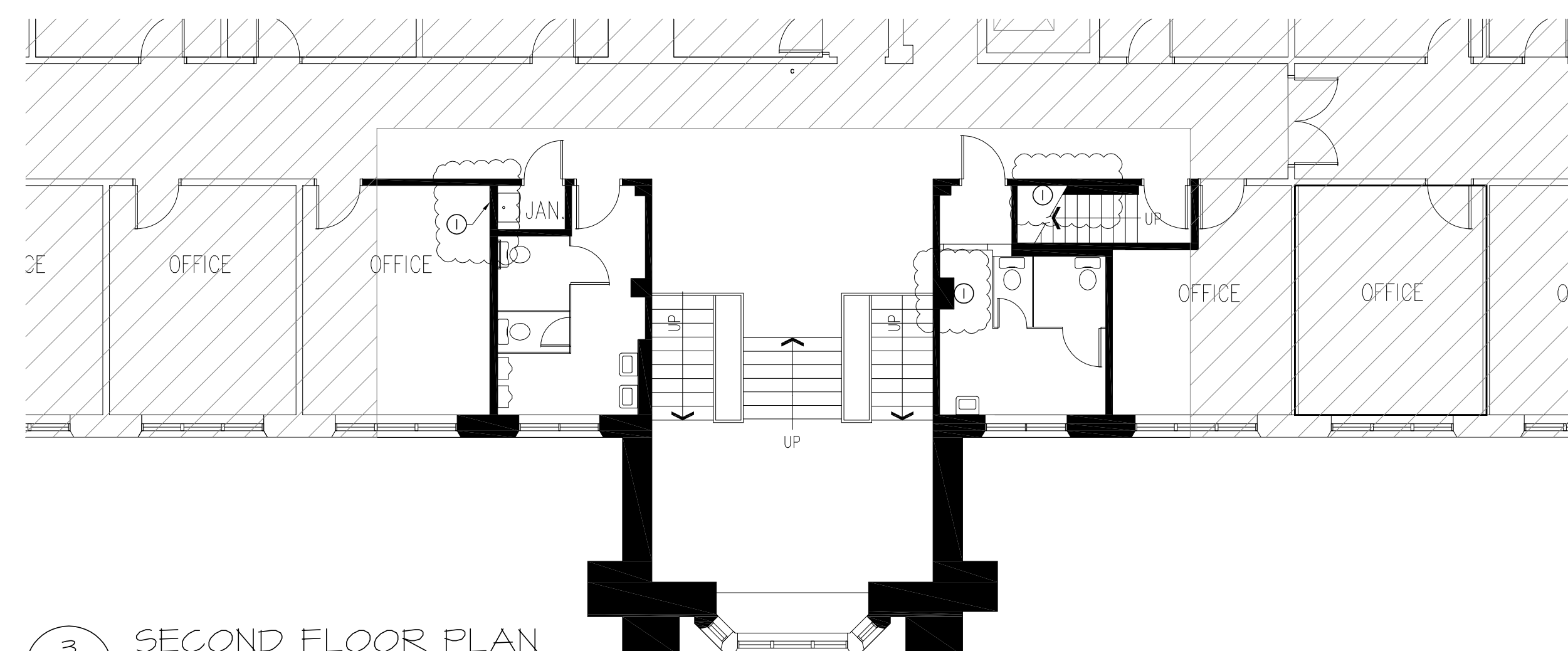
SCALE	AS NOTED	DRAWN BY	EG	DESIGNED BY	EG/AH
DATE	OCTOBER 1, 2015	CHECKED BY	SAS		
PROJECT NO.	A654	DRAWING NO.	ID-6		



**1** BASEMENT PLAN  
 ID-7 SCALE: 1:100



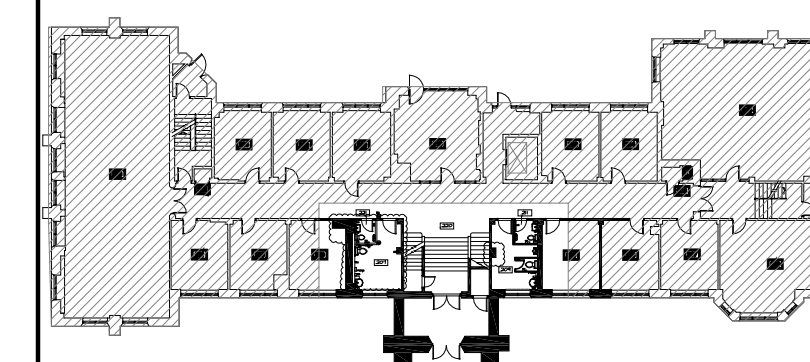
**2** GROUND FLOOR PLAN  
 ID-7 SCALE: 1:100



**3** SECOND FLOOR PLAN  
 ID-7 SCALE: 1:100

**DRAWING SPECIFIC NOTES**

- ① AS CLOUDED, DEMOLISH EXISTING PLASTER CEILING AND/OR BULKHEADS AND/OR WALLS TO COMPLETE MODIFICATIONS TO PLUMBING SERVICES FROM FLOOR ABOVE AS REQUIRED. CEILING AND WALLS TO BE REPAIRED UPON COMPLETION WITH NEW DRYWALL AND MATCH ADJACENT EXISTING OR NEW FINISHES. ENSURE ALL PENETRATIONS THROUGH WALLS AND FLOOR SLABS MAINTAIN THE EXISTING FIRE SEPARATION RATINGS. REFER TO MECHANICAL DRAWINGS FOR EXTENT OF DEMOLITION.



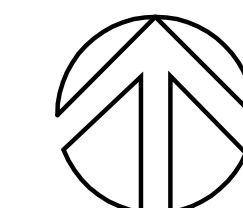
KEY PLAN

3	11/22/2015	Issued for Tender
2	11/03/2015	Issued for Tender
1	10/30/2015	Issued for 49% review

NO.	DATE	REVISION
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STAMP	PROJECT NORTH									
										
<table border="1"> <tr> <td>A</td> <td>DETAIL NUMBER</td> <td>A</td> </tr> <tr> <td>B</td> <td>LOCATION ON DRAWING NO.</td> <td>B</td> </tr> <tr> <td>C</td> <td>DRAWING NUMBER</td> <td>C</td> </tr> </table>	A	DETAIL NUMBER	A	B	LOCATION ON DRAWING NO.	B	C	DRAWING NUMBER	C	
A	DETAIL NUMBER	A								
B	LOCATION ON DRAWING NO.	B								
C	DRAWING NUMBER	C								

PROJECT  
 AGRICULTURE AND AGRICULTURE  
 FOOD CANADA  
 BUILDING 49  
 CENTRAL EXPERIMENTAL FARM

DRAWING TITLE  
 RISER REMOVE AND  
 REINSTATE COORDINATION  
 PLANS  
 BASEMENT, GROUND FLOOR AND  
 SECOND FLOOR

SCALE	AS NOTED	DRAWN BY	EG	DESIGNED BY	EG/AH
DATE	OCTOBER 1, 2015	CHECKED BY	SAS		
PROJECT NO.	A654	DRAWING NO.	ID-7		

# AGRICULTURE AND AGRI FOOD CANADA BUILDING 49 EAST. CENTRAL EXPERIMENTAL FARM MECHANICAL

Client

DRAWING LIST	
DWG #	DESCRIPTION
M1	MECHANICAL LEGENDS, DRAWING LIST & SCHEDULES
M2	MECHANICAL EAST BASEMENT & GROUND FLOOR PLUMBING - DEMOLITION & NEW WORK
M3	MECHANICAL EAST GROUND & SECOND FLOOR PLUMBING & HVAC - DEMOLITION & NEW WORK
M4	MECHANICAL WEST BASEMENT & GROUND FLOOR PLUMBING - DEMOLITION & NEW WORK
M5	MECHANICAL WEST GROUND & SECOND FLOOR PLUMBING & HVAC - DEMOLITION & NEW WORK

GENERAL LEGEND	
SYMBOL	DESCRIPTION
	EXISTING PIPING/DUCTWORK/EQUIPMENT
	EXISTING PIPING/DUCTWORK/EQUIPMENT TO BE REMOVED/RELOCATED
	NEW/RELOCATED PIPING/DUCTWORK/EQUIPMENT
	PIPING BELOW SLAB
(E)	DENOTES EXISTING EQUIPMENT
(R)	DENOTES RELOCATED EQUIPMENT
(N)	DENOTES NEW EQUIPMENT

HVAC LEGEND	
SYMBOL	DESCRIPTION
	DUCTWORK
	ROUND DUCTWORK
	THERMALLY INSULATED DUCT (RETURN OR SUPPLY)
	ACOUSTICALLY LINED DUCTWORK (RETURN OR SUPPLY)
	TAKE-OFF C/W BALANCING DAMPER
	SQUARE SUPPLY DIFFUSER (TYPE)
	RETURN GRILLE (RG)
	TRANSFER GRILLE (TG)
	FLEXIBLE CONNECTION
	EXHAUST FAN (EF)
	GRILLE TAG
	GRILLE TYPE
	AIRFLOW (L/S)
	DIMENSIONS (MM)
	SPEED CONTROLLER

PLUMBING LEGEND	
SYMBOL	DESCRIPTION
	BELOW SLAB SANITARY PIPING
	SANITARY PIPING
	DOMESTIC COLD WATER PIPING
	DOMESTIC HOT WATER PIPING
	PIPING OFFSET
	BRANCH PIPING DOWN
	PIPING DOWN
	PIPING UP
	REDUCER
	CAP
	ISOLATION VALVES
	FLOOR DRAIN
	TEMPERATURE SENSOR

FAN SCHEDULE											
UNIT NO.	LOCATION	FUNCTION	FAN DATA				ELECTRICAL DATA			REMARKS	
			TYPE	DRIVE (BELT/DIRECT)	AIR FLOW (L/S)	ESP (PA)	FAN SPEED (RPM)	SONES	V/PH/Hz		WATTS
EF-1	GROUND FLOOR	EXHAUST	INLINE CABINET	DIRECT	190	65	1070	2.0	120/1/60	217	-

NOTES:  
 1. FOR DETAILS REFER TO SPECIFICATIONS.  
 2. DISCONNECT SWITCH BY ELECTRICAL CONTRACTOR.

FIXTURE CONNECTION SCHEDULE				
FIXTURE	DOMESTIC COLD WATER	DOMESTIC HOT WATER	SANITARY	COMMENTS
L1	1.5ø	1.5ø	4øø	BASIN: BARRIER FREE LAVATORY, SEMI-COUNTER BASIN, REAR OVERFLOW, FAUCET LEDGE, 3 HOLES, 102mm CENTER, NOMINAL DIMENSIONS: 559mmW X 546mm FRONT TO BACK X 210mm HIGH, BOWL DIMENSIONS: 482mm X 381mm X 175mm. TRIM: TWO HANDLE LAVATORY FAUCET, CHROME PLATED, 102mm CENTERSET, LEAD FREE CAST BRASS BODY, VANDAL RESISTANT, 1.9LPM PRESSURE COMPENSATING NON AERATING SPRAY OUTLET, WRISTBLADE HANDLES WITH BLUE AND RED INDEX BUTTONS, 13MM COMPRESSION FLEXIBLE STAINLESS STEEL SUPPLY HOSE.
L2	1.5ø	1.5ø	4øø	BASIN: WALL MOUNTED, WHITE WASHBASIN 500mm WIDTH, 380mm DEPTH, CARRIER, DECORATIVE ROUND-STYLE POLISHED CHROME BOTTLE TRAP TRIM: DECK MOUNTED BASIN MONO MIXER, C/W CERAMIC CARTRIDGE & FLEXIBLE TAILS
U1	1.5ø	-	5øø	URINAL: WALL HUNG, VITREOUS CHINA, EXTENDED SIDES, WASHDOWN ACTION, FLUSHING RIM, 19mm TOP SPUD, INTEGRAL P TRAP, CARRIER, NOMINAL DIMENSIONS: 470mmWIDE X 356mm PROJECTION X 692mm HIGH. FLUSH VALVE: CONCEALED FLUSHMETER FOR TOP SPUD, 3.8L, QUIET ACTION, INFRARED SENSOR, 5VA POWER, HIGH PRESSURE VACUUM BREAKER, 102mm SQUARE ELECTRICAL BOX FOR MOUNTING SENSOR PLATE.
WC1	1.5ø	-	7.5øø	BARRIER FREE, WHITE FLOOR MOUNTED, FLOOR OUTLET, VITREOUS CHINA, TANK TYPE, SIPHON JET FLUSH ACTION, ELONGATED BOWL, LOW CONSUMPTION 4.8L PER FLUSH, NOMINAL DIMENSIONS: 495mmWIDE X 794mm FRONT TO BACK X 800mmHIGH. TOILET SEAT: HEAVY DUTY FOR ELONGATED BOWL, OPEN FRONT WITH COVER.
WC2	1.5ø	-	7.5øø	WHITE FLOOR MOUNTED, FLOOR OUTLET, VITREOUS CHINA, TANK TYPE, LOW CONSUMPTION 4.8L PER FLUSH, ROUND FRONT, NOMINAL DIMENSIONS: 438mmWIDE X 718mm FRONT TO BACK X 733mm HIGH. TOILET SEAT: HEAVY DUTY, OPEN FRONT WITHOUT COVER.

NOTES:  
 1. COORDINATE EXACT PIPING LOCATION ON SITE.  
 2. VENT TO MEET OBC REQUIREMENTS, VENTING THROUGH SLOPED ROOFS NOT PERMITTED.  
 3. MINIMUM UNDERGROUND SANITARY PIPING SIZE TO BE 50ø.  
 4. INSTALLATION OF SINK TO COMPLY WITH LATEST EDITION OF CSA B651 STANDARD FOR BARRIER-FREE ACCESS. INSULATE DOMESTIC HOT WATER AND DRAIN PIPING UNDER COUNTER C/W WHITE PVC JACKET. SEE ARCH. DWG FOR DETAILS.

DATE	REVISION	REF
NOV. 13, 2015	ISSUED FOR TENDER	0
OCT. 30, 2015	ISSUED FOR 99% REVIEW	-

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Project north  
Nord du projet

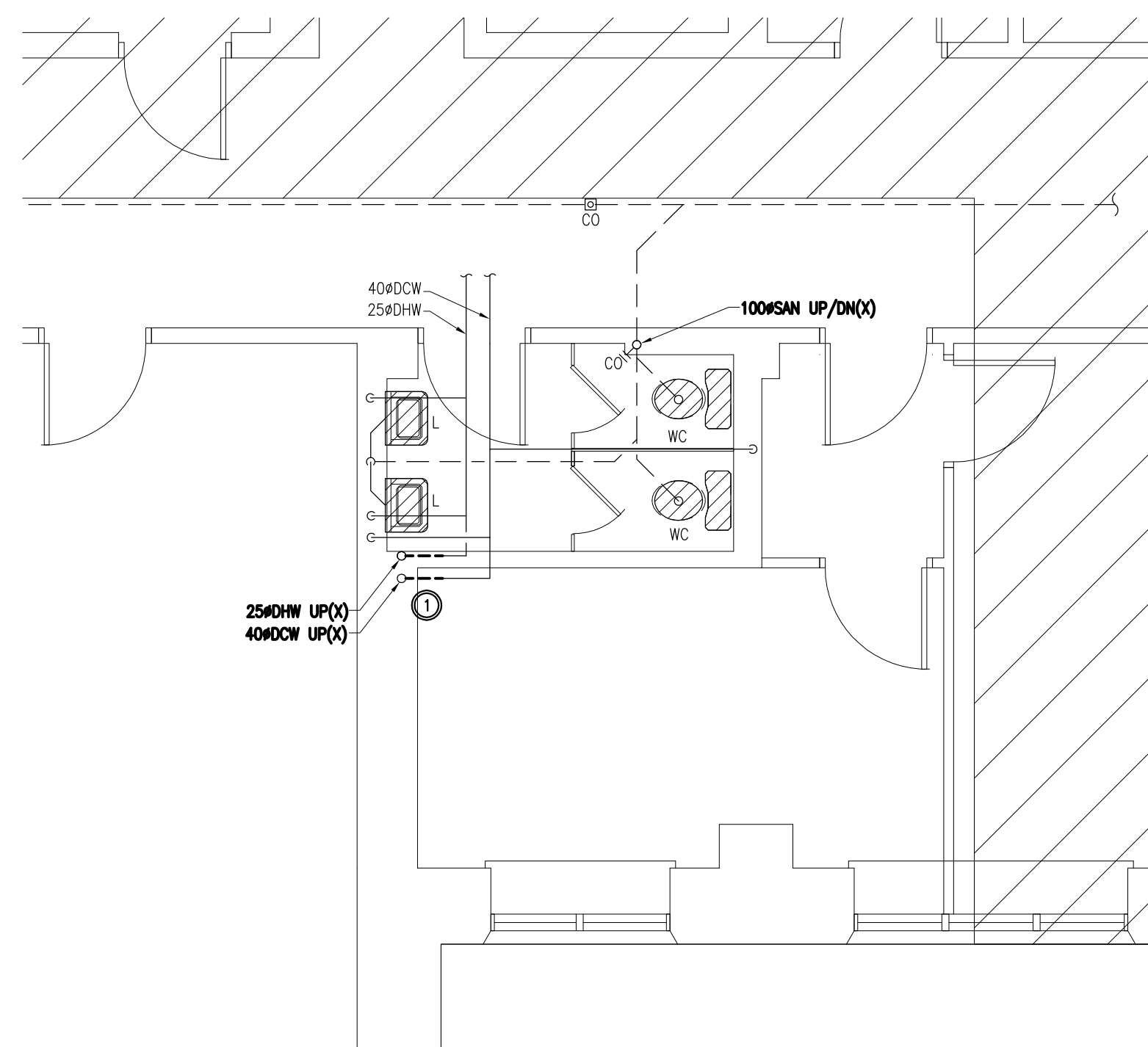
Seal/Scram

Project/Projet  
**AGRICULTURE AND AGRI FOOD CANADA  
BUILDING 49 EAST.**

Drawing title/Titre du dessin  
**MECHANICAL LEGENDS,  
DRAWING LIST &  
SCHEDULES**

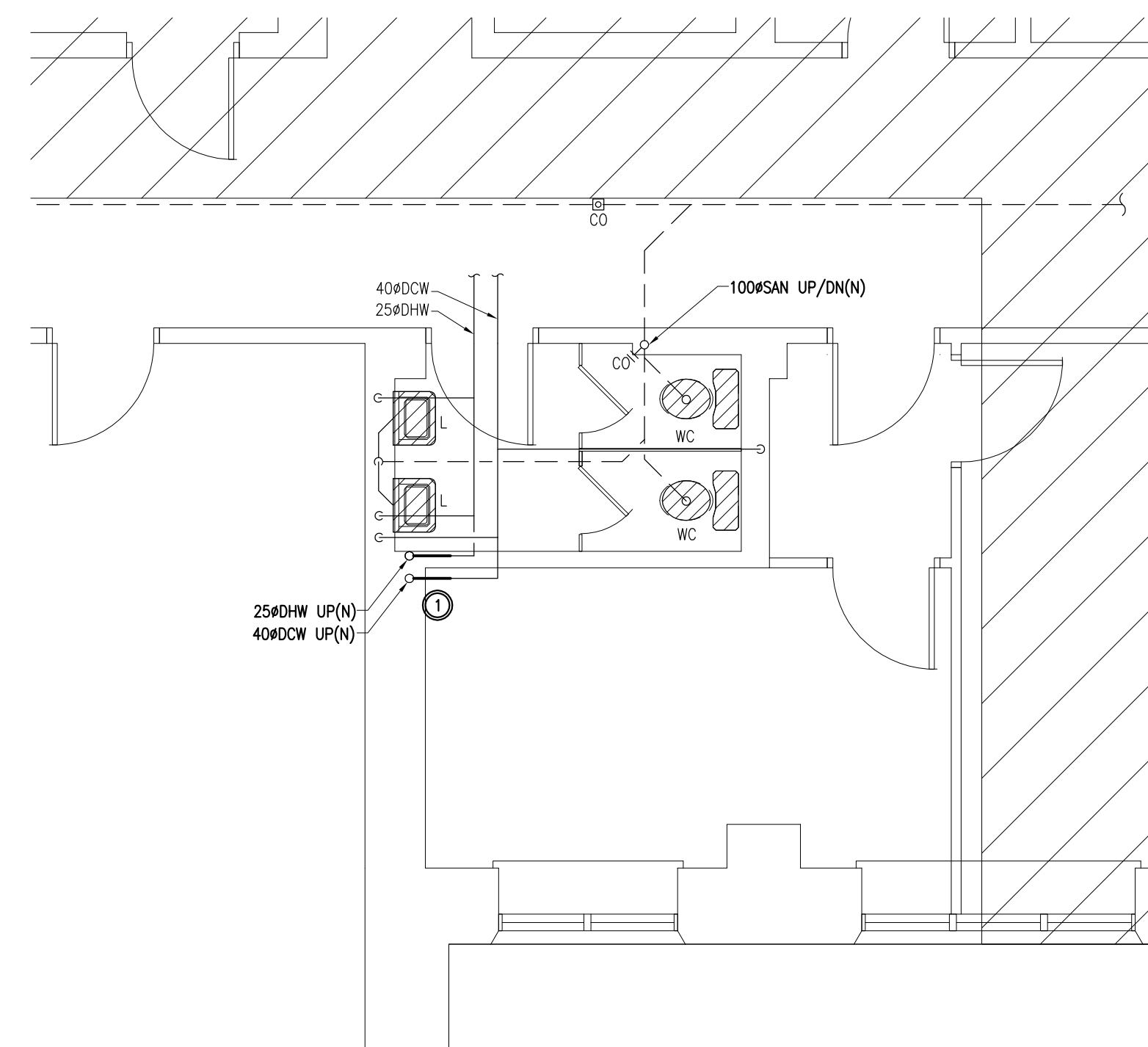
Scale Échelle	AS NOTED	Project no./No. du projet A654
Design by Conçu par	S.HAMILTON	Drawing/Dessin
Drawn by Dessiné par	S.VALLIER	<b>M1</b>
Reviewed by Examiné par	S.HAMILTON	
Date Date	OCTOBER 2015	Revision no. Z:/2015-476 0

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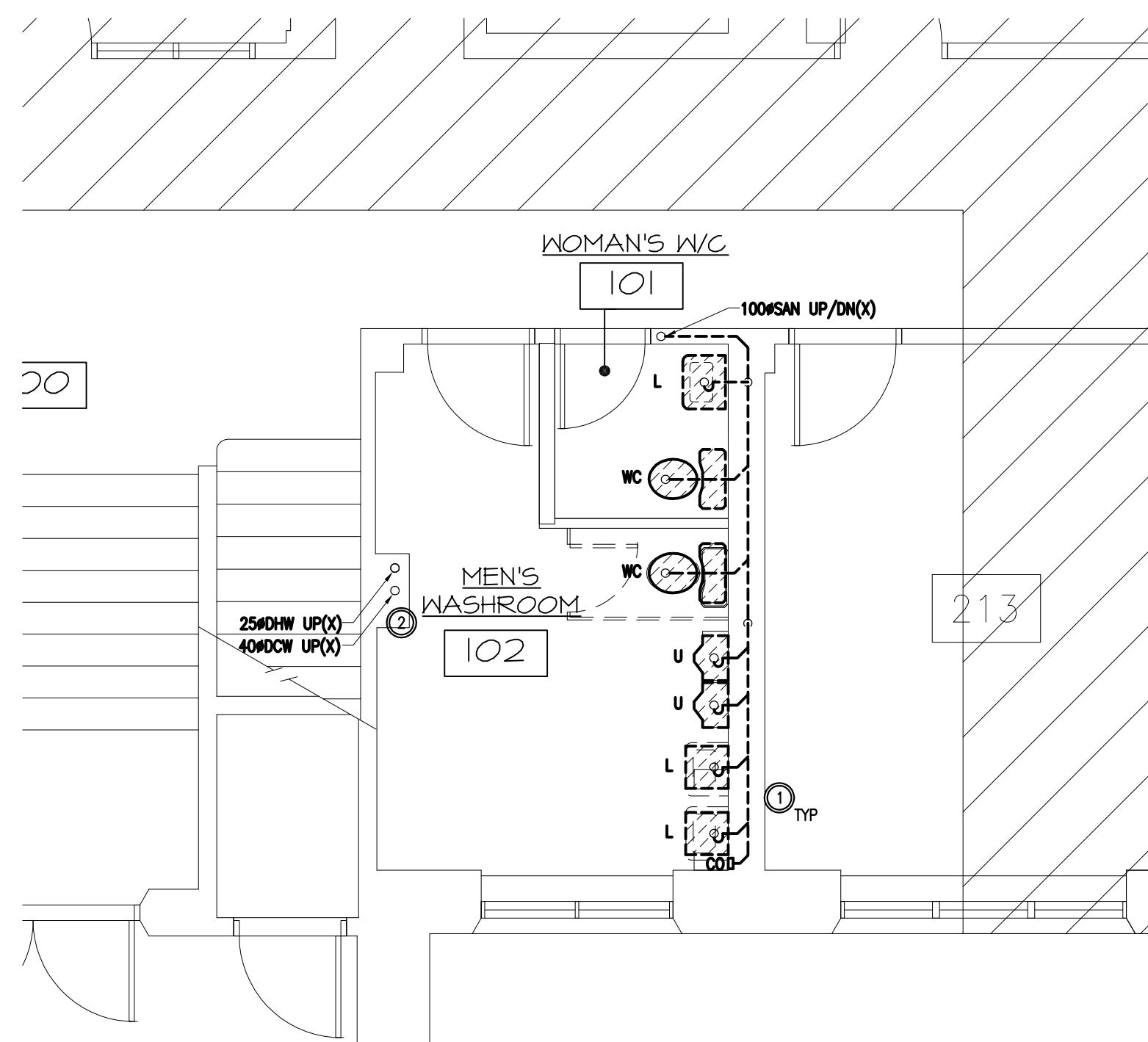
**1**  
M2  
1:50  
BASEMENT FLOOR - EAST  
PLUMBING - DEMOLITION

DESCRIPTION OF WORK:  
 ① REMOVE EXISTING DCW, DHW, SAN, & VENT RISERS AS INDICATED.



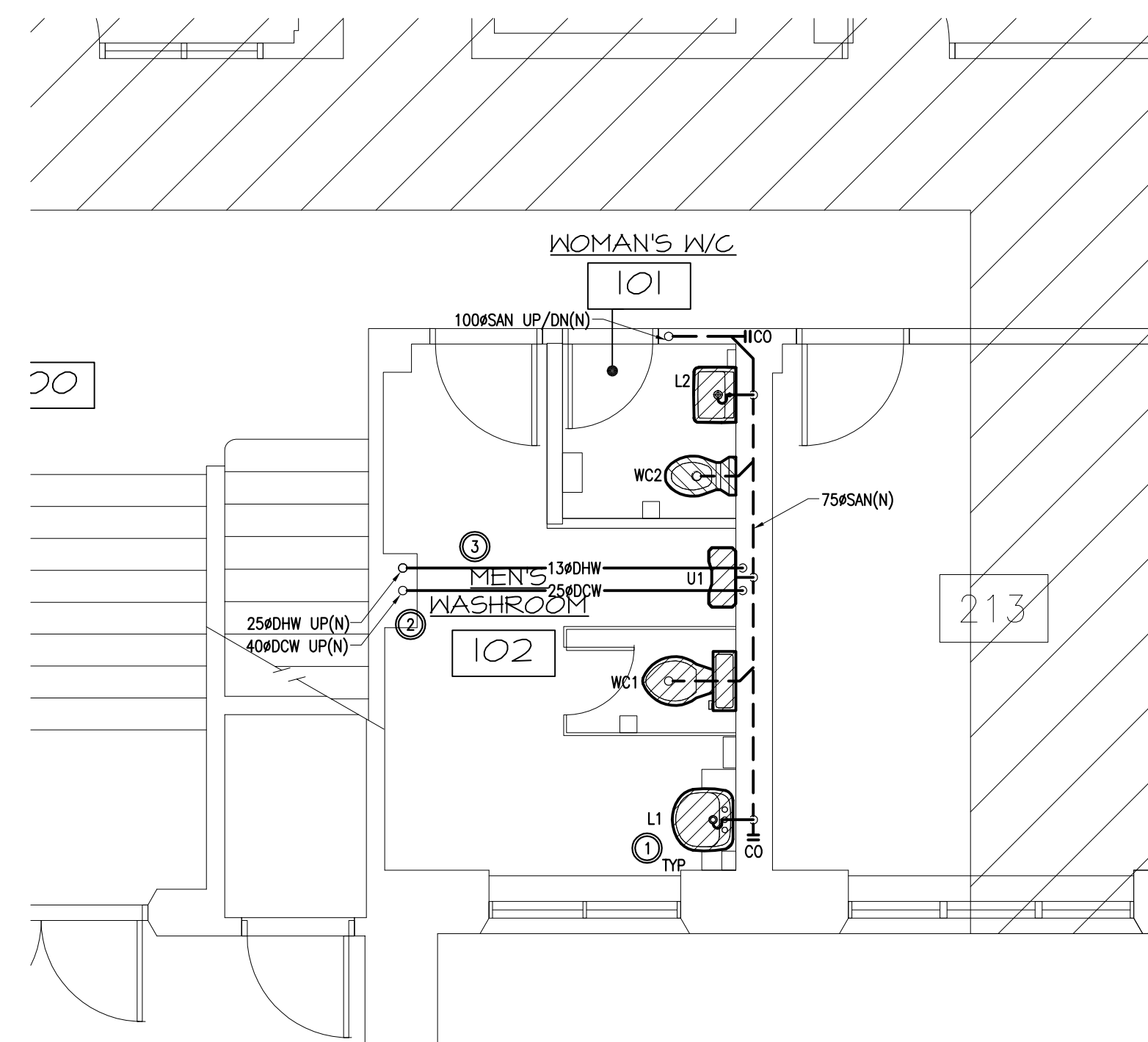
**2**  
M2  
1:50  
BASEMENT FLOOR - EAST  
PLUMBING - NEW WORK

DESCRIPTION OF WORK:  
 ① PROVIDE NEW DCW, DHW, SAN & VENT RISERS AS INDICATED.



**3**  
M2  
1:50  
GROUND FLOOR - EAST  
PLUMBING - DEMOLITION

DESCRIPTION OF DEMOLITION:  
 ① REMOVE EXISTING PLUMBING FIXTURES C/W ALL ASSOCIATED DCW, DHW, VENT, SAN & ACCESSORIES AS INDICATED.  
 ② REMOVE EXISTING DCW, DHW, SAN, & VENT RISERS AND DISTRIBUTION.



**4**  
M2  
1:50  
GROUND FLOOR - EAST  
PLUMBING - NEW WORK

DESCRIPTION OF WORK:  
 ① PROVIDE NEW PLUMBING FIXTURES C/W ALL ASSOCIATED DCW, DHW, VENT & SAN PIPING AND ACCESSORIES AS INDICATED. EXTEND/MODIFY EXISTING PIPING AS REQUIRED.  
 ② REPLACE EXISTING DCW, DHW, SAN & VENT RISERS WITH NEW.  
 ③ PROVIDE NEW DCW & DHW DISTRIBUTION PIPING WITHIN WASHROOM.

Client

DATE	REVISION	REF
NOV. 13, 2015	ISSUED FOR TENDER	0
OCT. 30, 2015	ISSUED FOR 99% REVIEW	-

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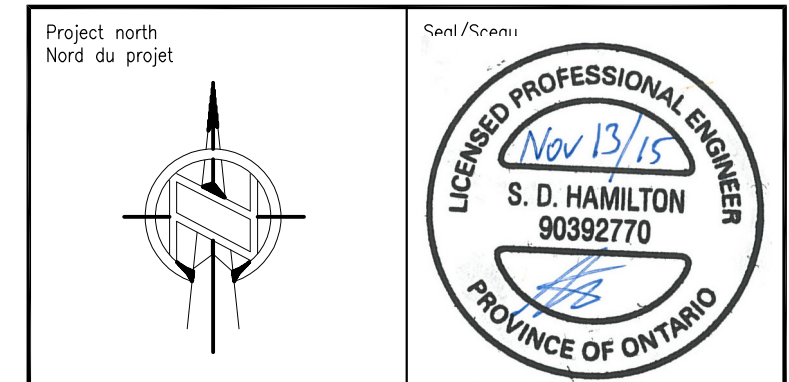
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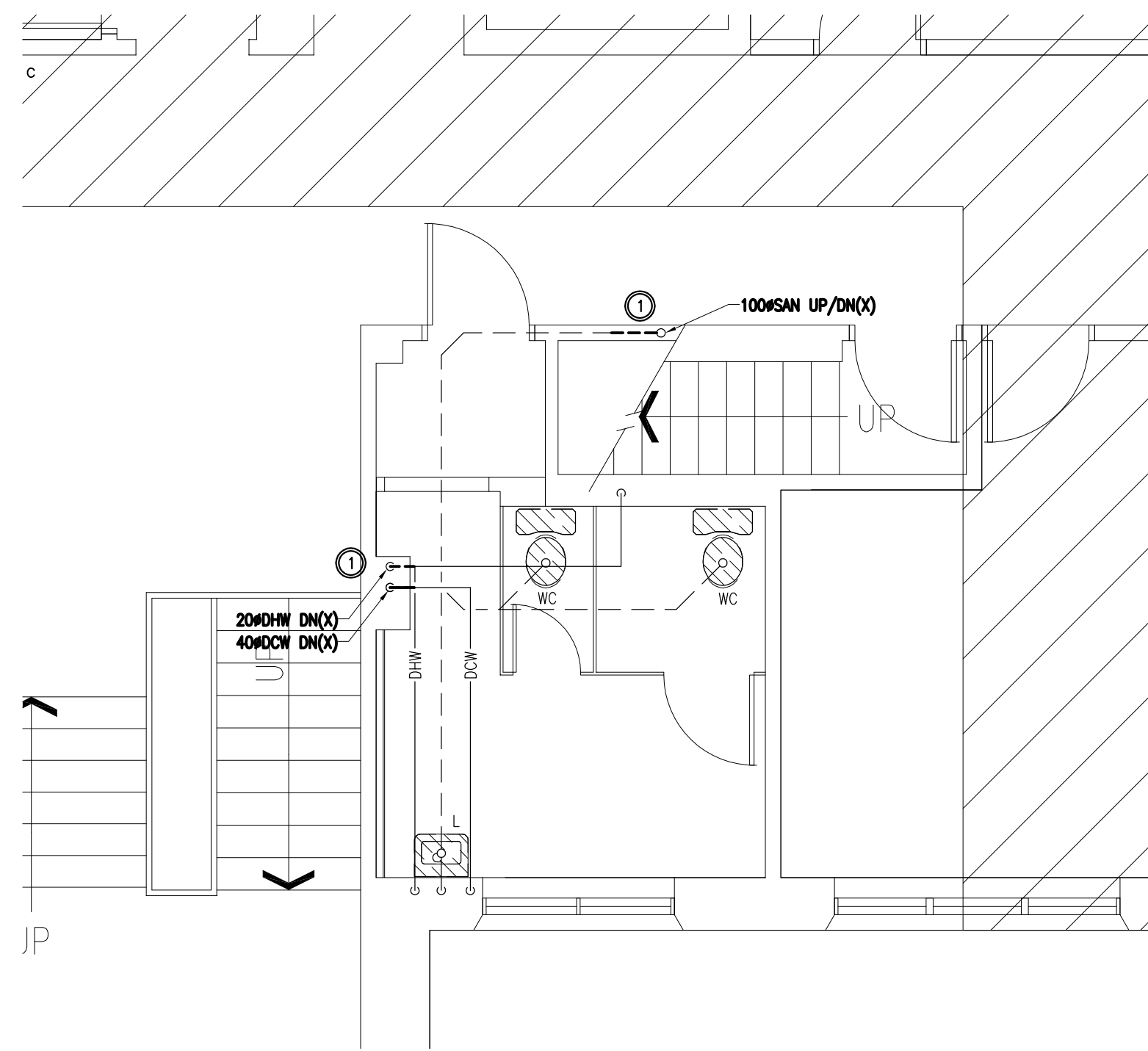
Project/Projet  
**AGRICULTURE AND AGRI FOOD CANADA BUILDING 49 EAST.**

Drawing title / Titre du dessin  
**MECHANICAL - EAST BASEMENT & GROUND FLOOR - PLUMBING DEMOLITION & NEW WORK**

Scale / Échelle	AS NOTED	Project no./No. du projet	A654
Design by / Conçu par	S.HAMILTON	Drawing/Dessin	M2
Drawn by / Dessiné par	S.VALLIER	Reviewed by / Examiné par	S.HAMILTON
Date	OCTOBER 2015	Revision no.	0
Date		Acad. file/Fichier:	Z:/2015-476

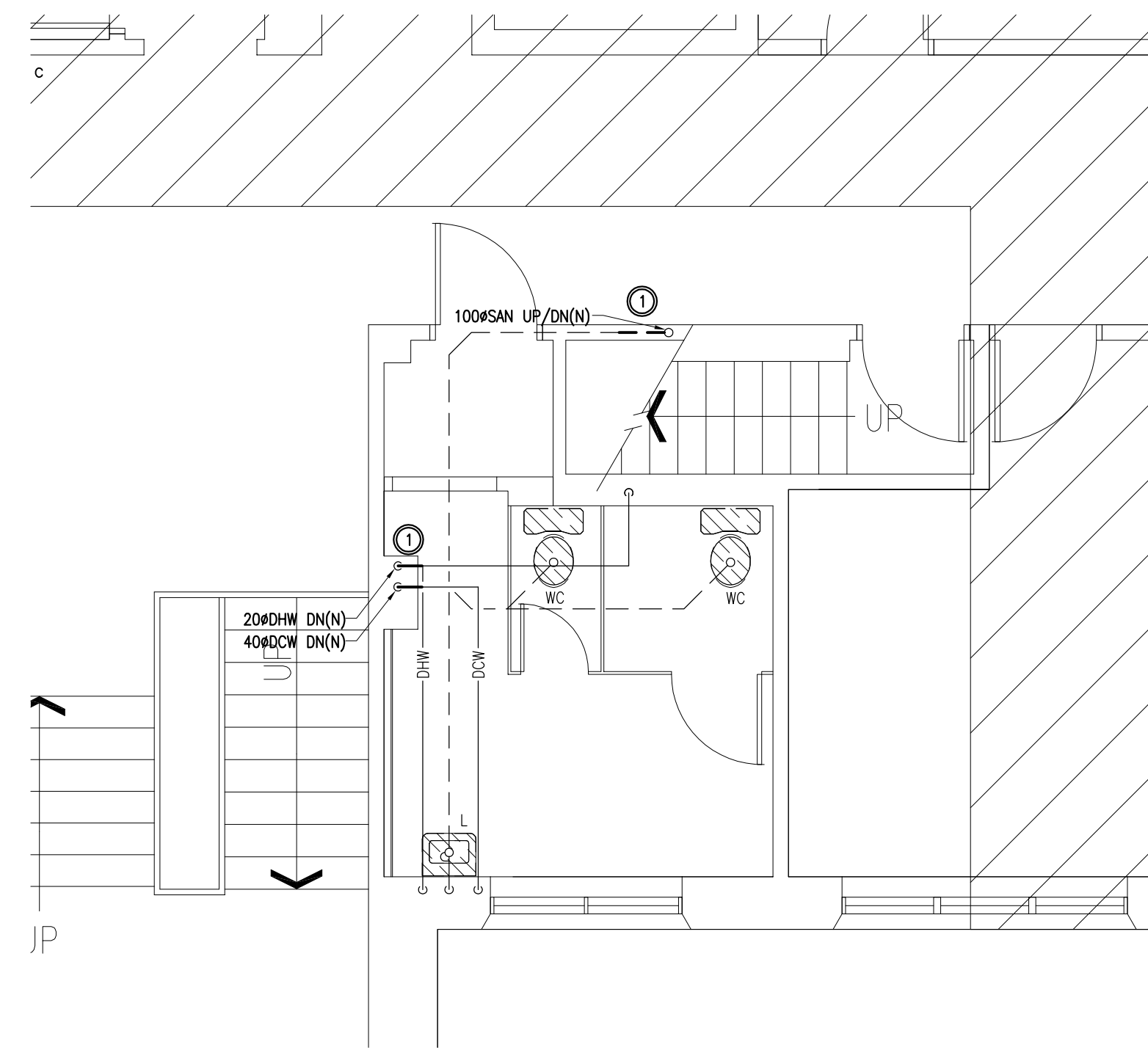
of 5





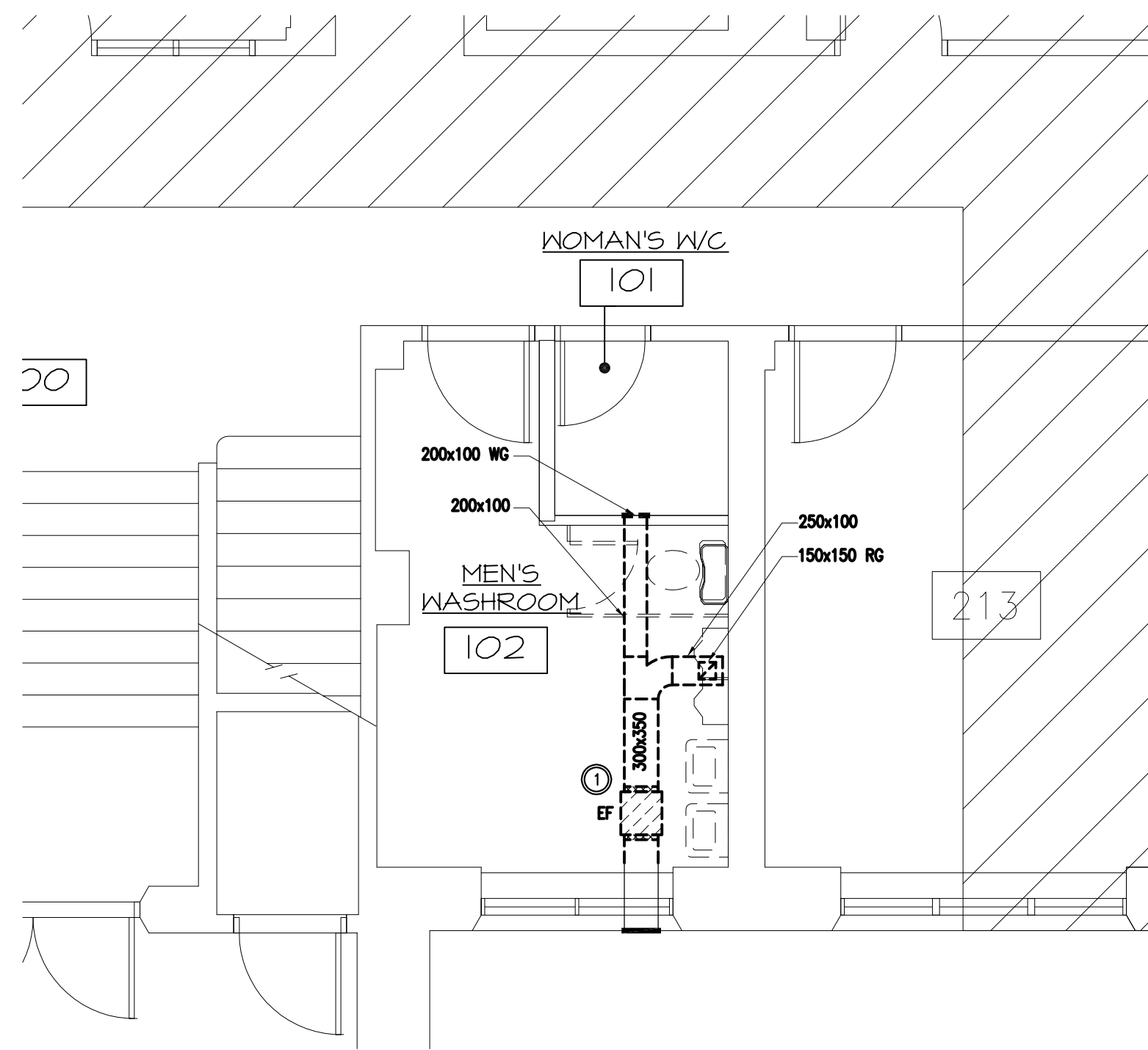
1  
M3 1:50  
SECOND FLOOR - EAST  
PLUMBING - DEMOLITION

DESCRIPTION OF DEMOLITION:  
 ① REMOVE EXISTING DCW, DHW, SAN, & VENT RISERS AS INDICATED.



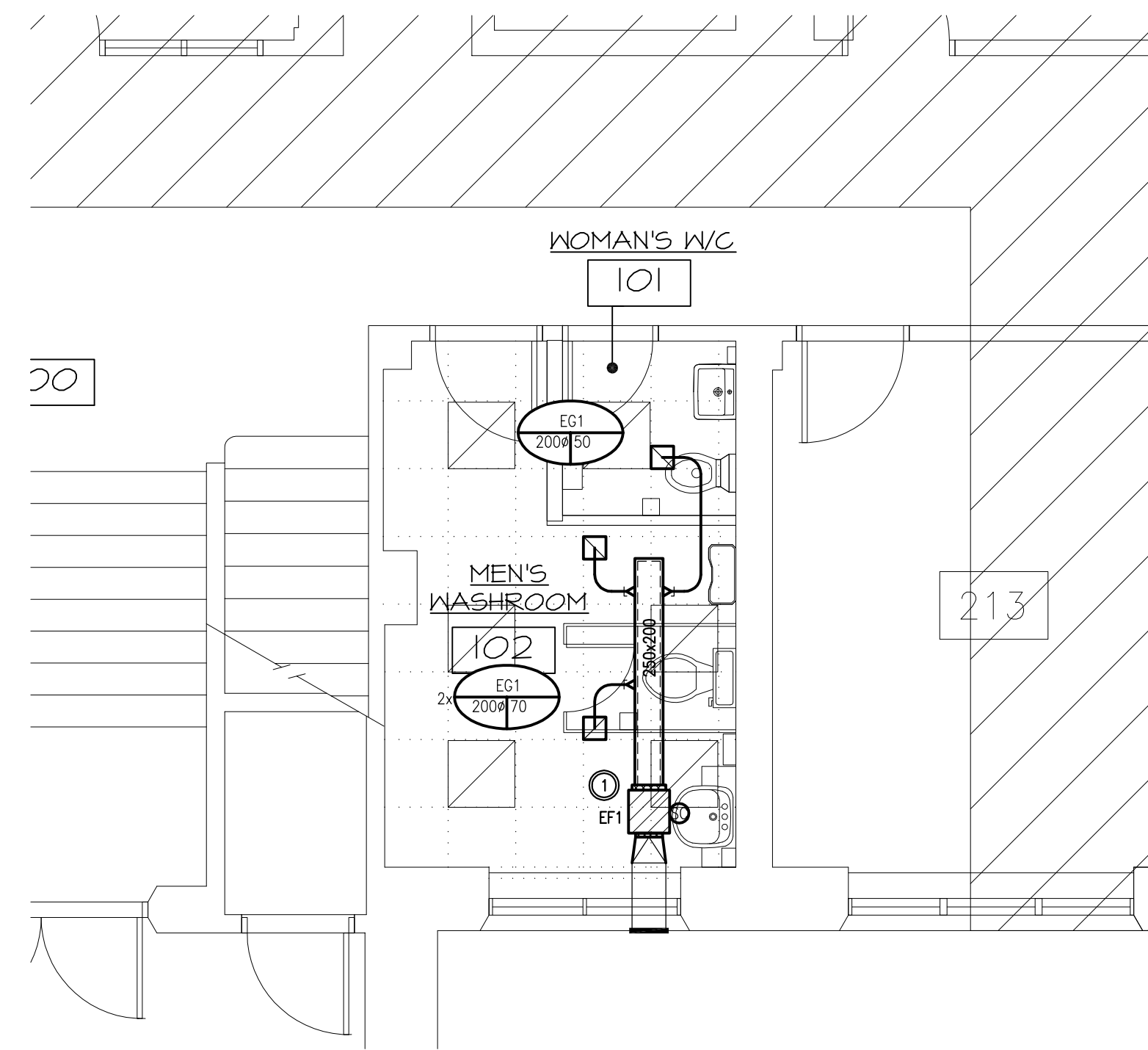
2  
M3 1:50  
SECOND FLOOR - EAST  
PLUMBING - NEW WORK

DESCRIPTION OF WORK:  
 ① REPLACE EXISTING DCW, DHW, SAN & VENT RISERS WITH NEW.



3  
M3 1:50  
GROUND FLOOR - EAST  
HVAC - DEMOLITION

DESCRIPTION OF DEMOLITION:  
 ① REMOVE EXISTING EXHAUST FAN C/W ALL ASSOCIATED DUCTWORK, GRILLES & ACCESSORIES AS INDICATED.



4  
M3 1:50  
GROUND FLOOR - EAST  
HVAC - NEW WORK

DESCRIPTION OF WORK:  
 ① PROVIDE NEW EXHAUST FAN C/W ALL ASSOCIATED DUCTWORK, GRILLES & ACCESSORIES AS INDICATED. INSTALL DUCTWORK AS HIGH AS POSSIBLE.

Client

DATE	REVISION	REF
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OCT. 30, 2015	ISSUED FOR 99% REVIEW	-

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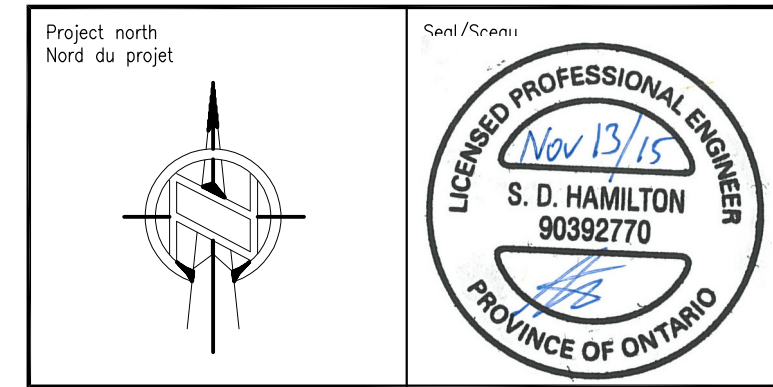
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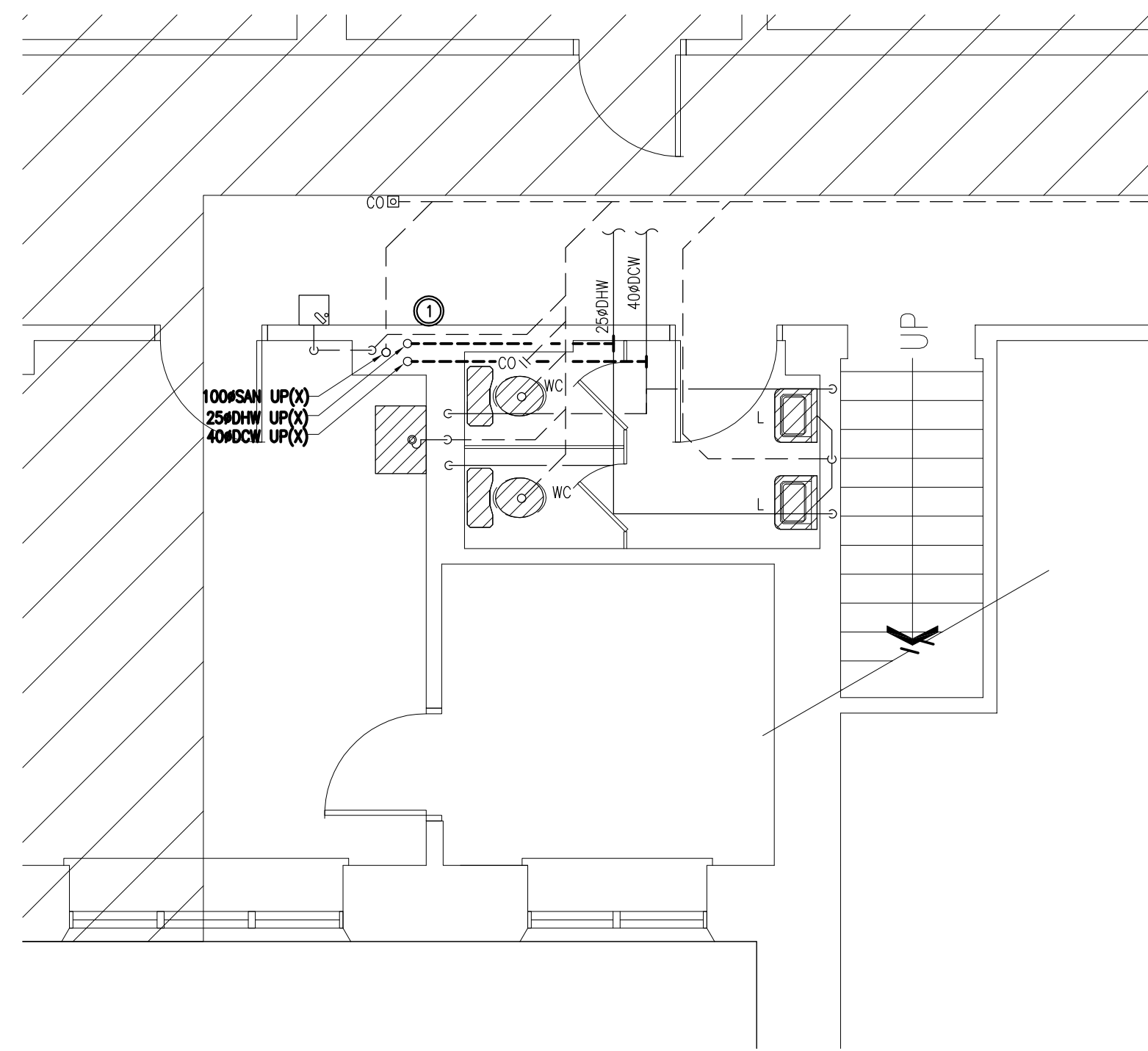
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Project/Projet  
**AGRICULTURE AND AGRI FOOD CANADA BUILDING 49 EAST.**

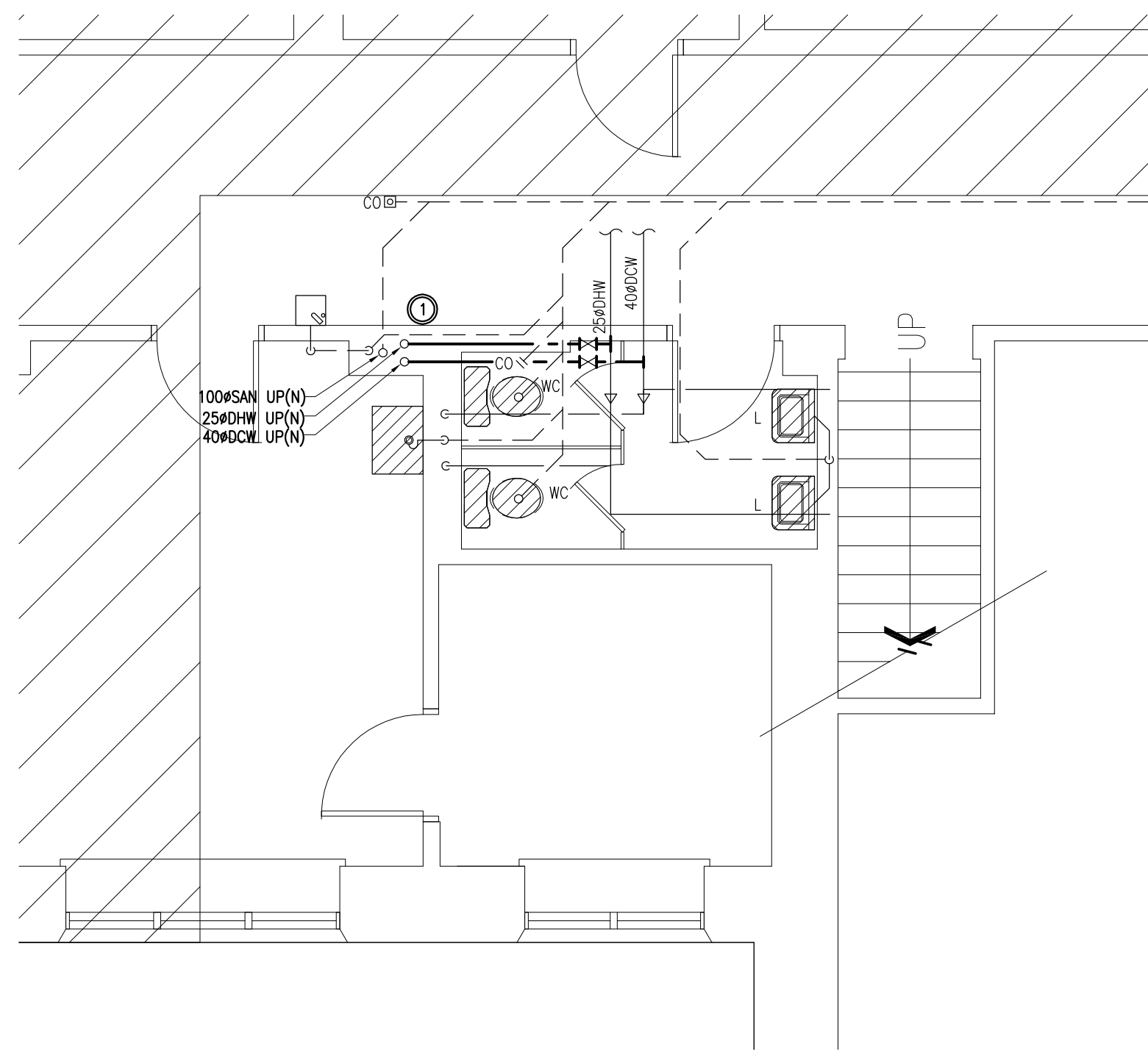
Drawing Title/Titre du dessin  
**MECHANICAL - EAST GROUND & SECOND FLOOR - PLUMBING & HVAC DEMOLITION & NEW WORK**

Scale / Échelle	AS NOTED	Project no./No. du projet	A654
Design by / Conçu par	S.HAMILTON	Drawing/Dessin	<b>M3</b>
Drawn by / Dessiné par	S.VALLIER		
Reviewed by / Examiné par	S.HAMILTON		
Date	OCTOBER 2015	Revision no.	0
Date		Acad. file/Fichier:	Z:/2015-476



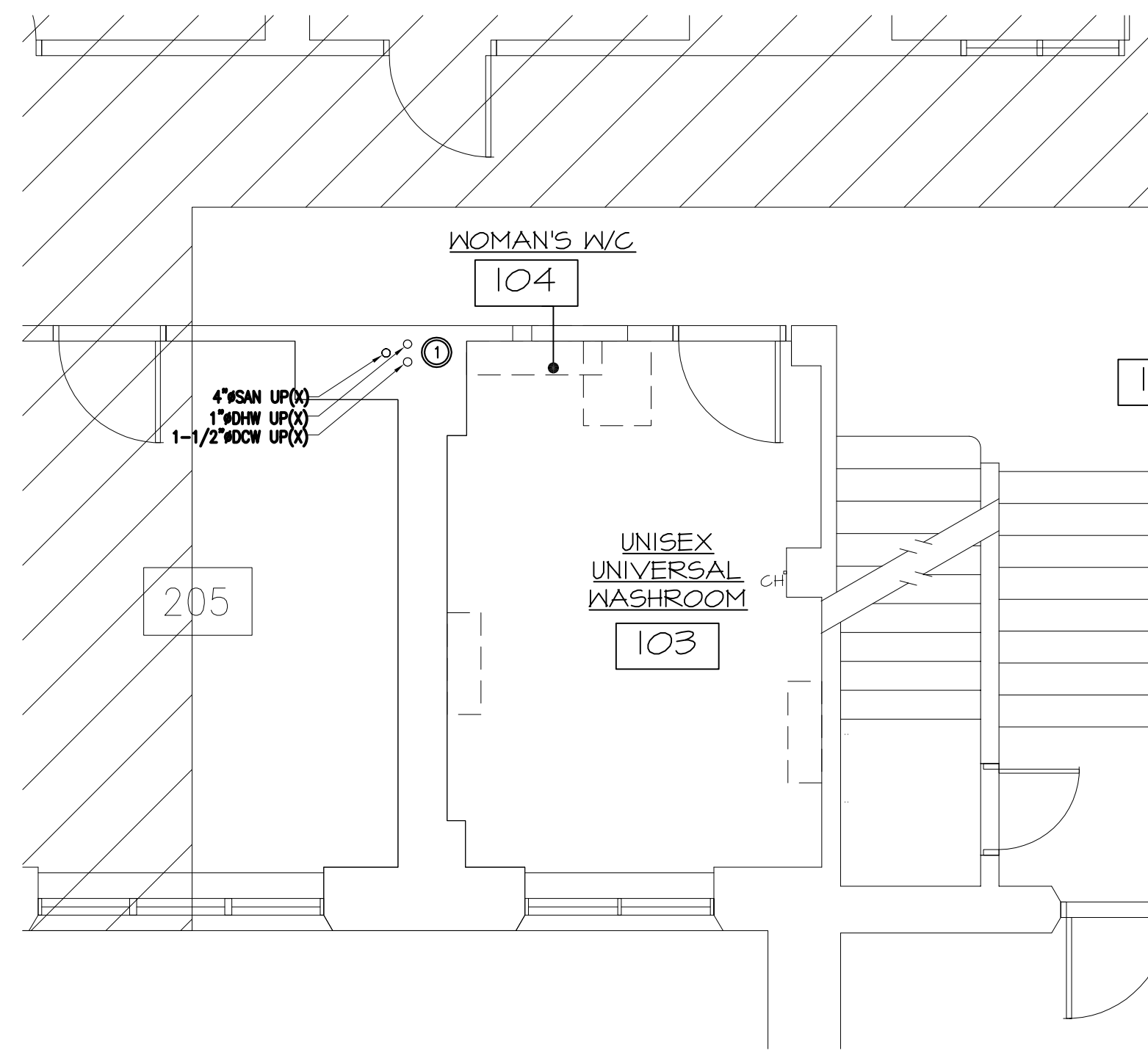
**1**  
M4 1:50  
BASEMENT FLOOR - WEST  
PLUMBING - DEMOLITION

DESCRIPTION OF DEMOLITION:  
 ① REMOVE EXISTING DCW, DHW, SAN, & VENT RISERS AS INDICATED.



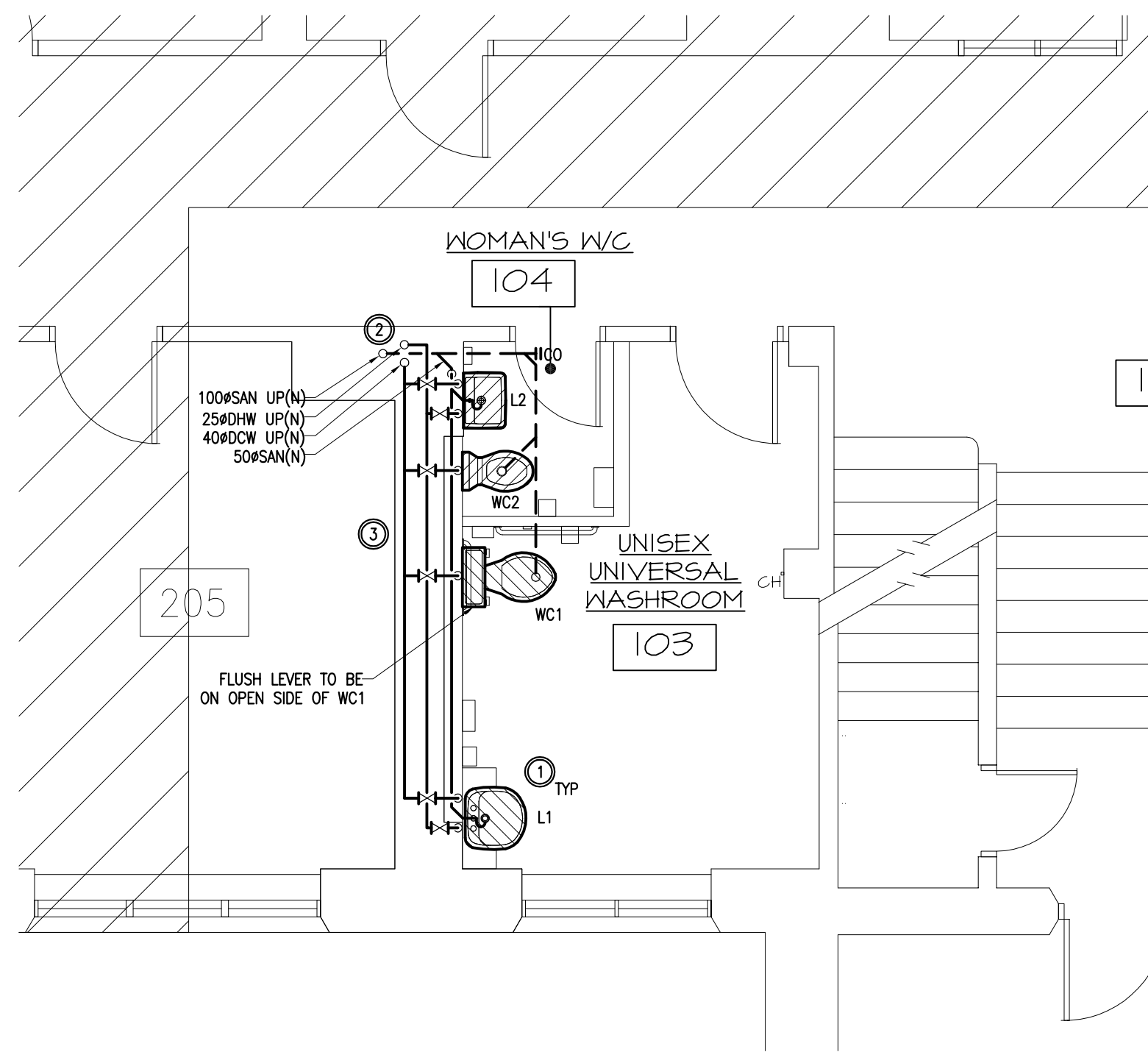
**2**  
M4 1:50  
BASEMENT FLOOR - WEST  
PLUMBING - NEW WORK

DESCRIPTION OF WORK:  
 ① REPLACE EXISTING DCW, DHW, SAN & VENT RISERS WITH NEW.



**3**  
M4 1:50  
GROUND FLOOR - WEST  
PLUMBING - DEMOLITION

DESCRIPTION OF DEMOLITION:  
 ① REMOVE EXISTING DCW, DHW, SAN, & VENT RISERS AS INDICATED.



**4**  
M4 1:50  
GROUND FLOOR - WEST  
PLUMBING - NEW WORK

DESCRIPTION OF WORK:  
 ① PROVIDE NEW PLUMBING FIXTURES G/W ALL ASSOCIATED DCW, DHW, VENT & SAN PIPING AND ACCESSORIES AS INDICATED.  
 ② REPLACE EXISTING DCW, DHW, SAN & VENT RISERS WITH NEW.  
 ③ PROVIDE NEW DCW & DHW DISTRIBUTION PIPING WITHIN WASHROOM.

Client

DATE	REVISION	REF
NOV. 13, 2015	ISSUED FOR TENDER	0
OCT. 30, 2015	ISSUED FOR 99% REVIEW	-

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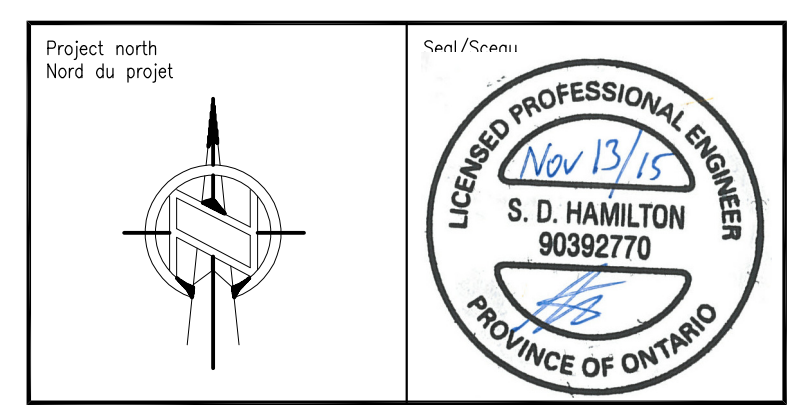
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Project north  
Nord du projet

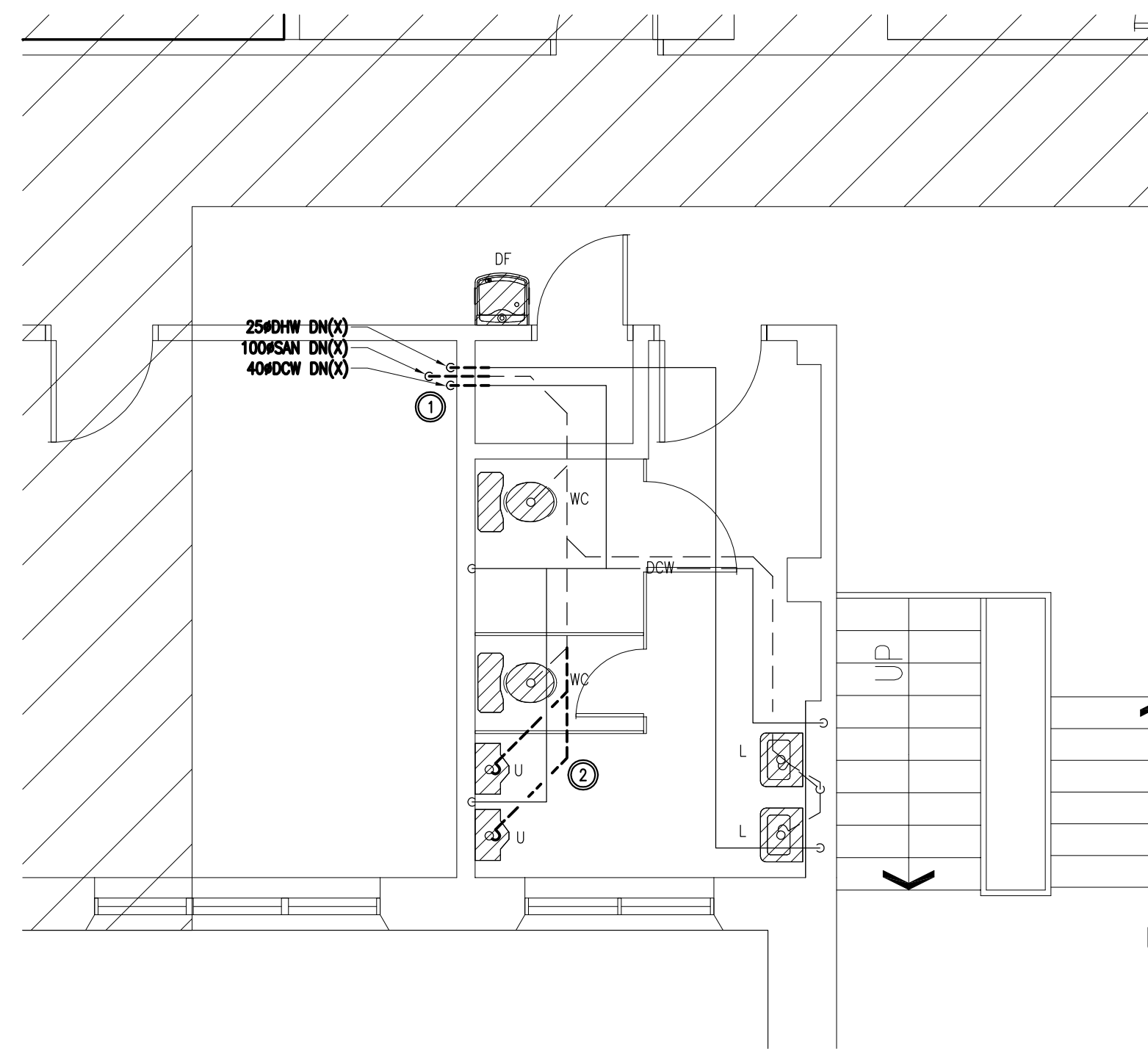


Project/Projet  
**AGRICULTURE AND AGRI FOOD CANADA BUILDING 49 EAST.**

Drawing title/Titre du dessin  
**MECHANICAL - WEST BASEMENT & GROUND FLOOR - PLUMBING DEMOLITION & NEW WORK**

Scale Échelle	AS NOTED A654	Project no./No. du projet A654
Design by Conçu par	S.HAMILTON	Drawing/Dessin
Drawn by Dessiné par	S.VALLIER	<b>M4</b>
Reviewed by Examiné par	S.HAMILTON	
Date Date	OCTOBER 2015	Revision no. Acad. file/Fichier: 0 Z:/2015-476

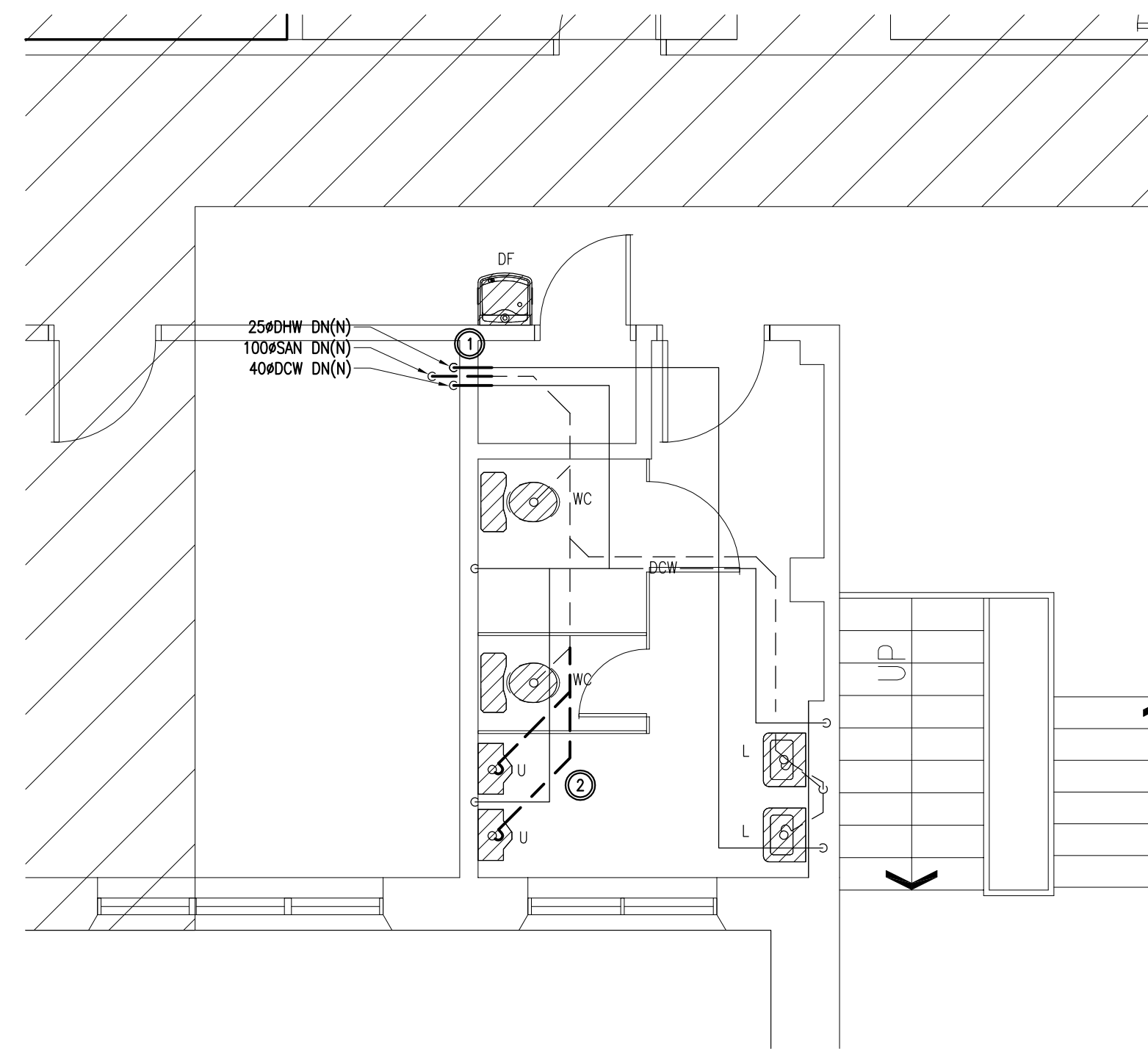
5



1  
M5 1:50  
SECOND FLOOR - WEST  
PLUMBING - DEMOLITION

DESCRIPTION OF DEMOLITION:

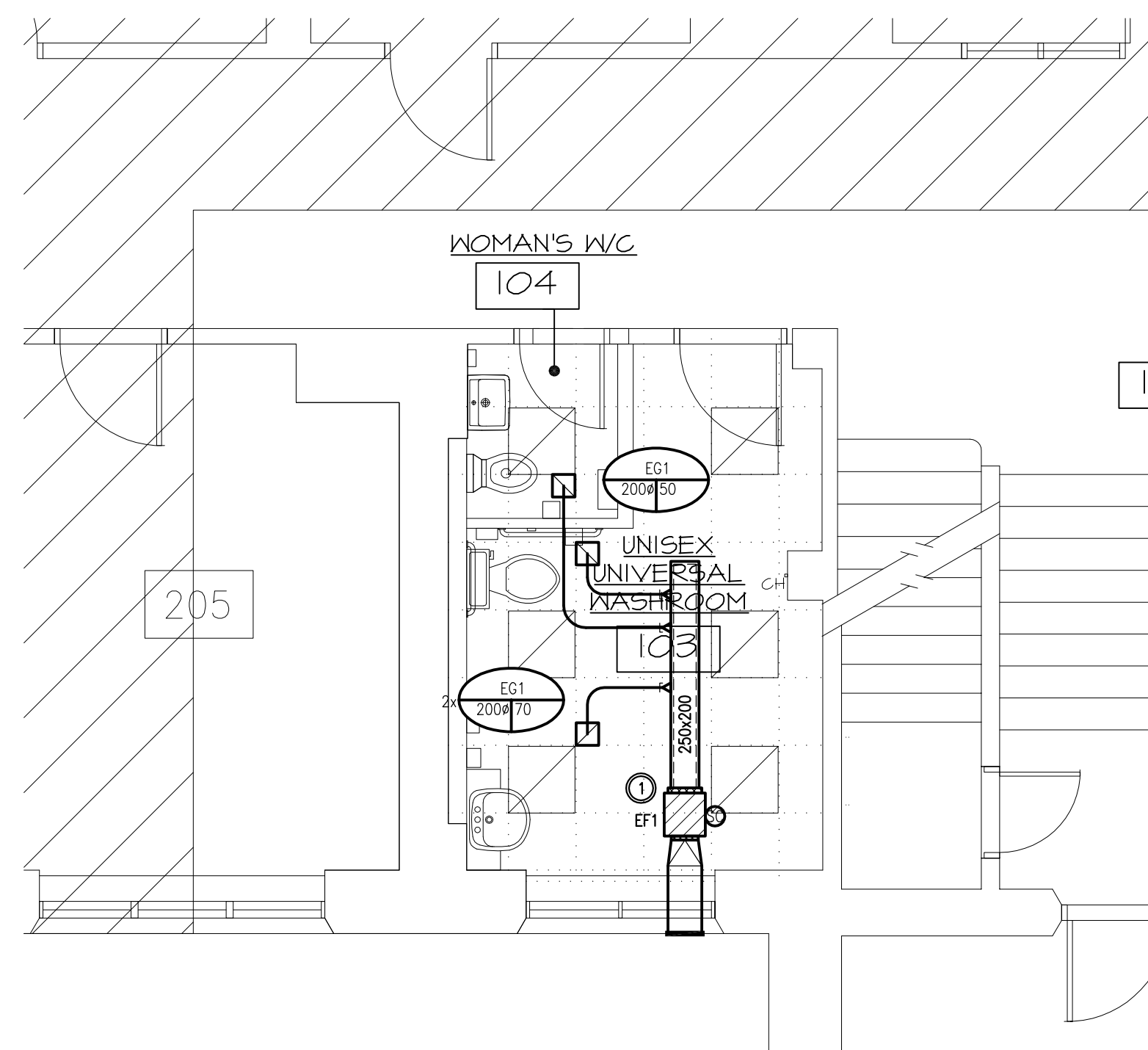
- 1 REMOVE EXISTING DCW, DHW, SAN, & VENT RISERS AS INDICATED.
- 2 REMOVE EXISTING SAN PIPING AS INDICATED.



2  
M5 1:50  
SECOND FLOOR - WEST  
PLUMBING - NEW WORK

DESCRIPTION OF WORK:

- 1 REPLACE EXISTING DCW, DHW, SAN & VENT RISERS WITH NEW.
- 2 PROVIDE NEW SAN PIPING AS INDICATED.



3  
M5 1:50  
GROUND FLOOR - WEST  
HVAC - NEW WORK

DESCRIPTION OF WORK:

- 1 PROVIDE NEW EXHAUST FAN C/W ALL ASSOCIATED DUCTWORK, GRILLES & ACCESSORIES AS INDICATED. INSTALL DUCTWORK AS HIGH AS POSSIBLE.

Client

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OCT. 30, 2015	ISSUED FOR 99% REVIEW	-

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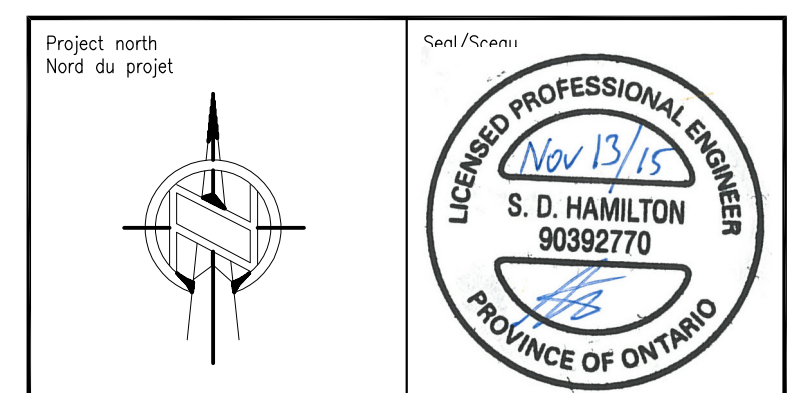
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Project/Projet  
**AGRICULTURE AND AGRI FOOD CANADA BUILDING 49 EAST.**

Drawing title/Titre du dessin  
**MECHANICAL - WEST GROUND & SECOND FLOOR - PLUMBING & HVAC DEMOLITION & NEW WORK**

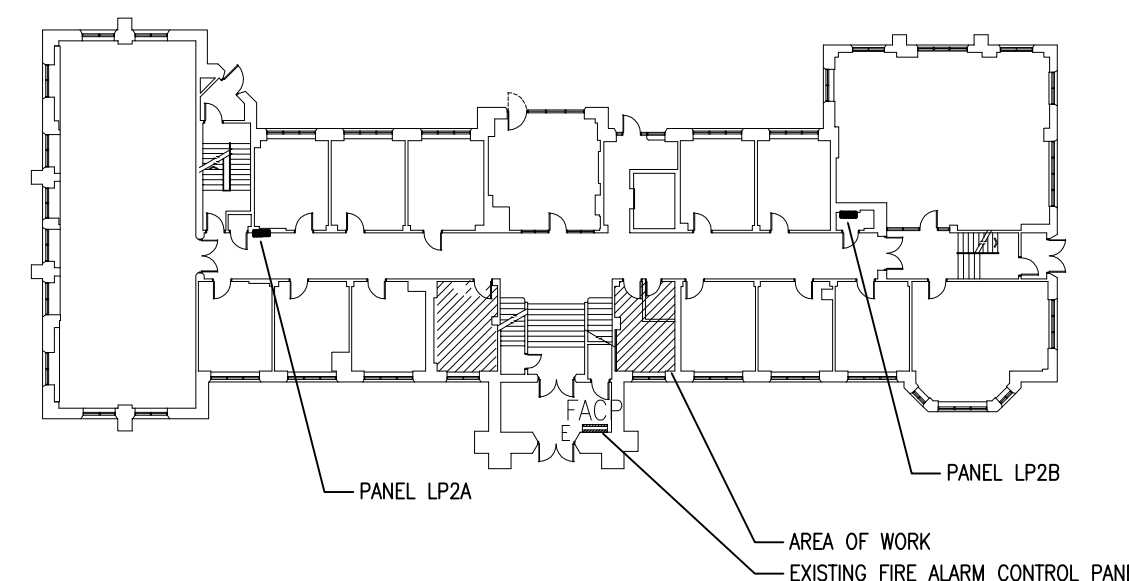
Scale Échelle	AS NOTED A654	Project no./No. du projet A654
Design by Conçu par	S.HAMILTON	Drawing/Dessin <b>M5</b>
Drawn by Dessiné par	S.VALLIER	or 5
Reviewed by Examiné par	S.HAMILTON	
Date Date	OCTOBER 2015	Revision no. Z:/2015-476

# AGRICULTURE AND AGRI FOOD CANADA BUILDING 49 EAST. CENTRAL EXPERIMENTAL FARM ELECTRICAL

LEGEND	
SYMBOL	DESCRIPTION
	FLUORESCENT LIGHT FIXTURE - TYPE AS SHOWN
	EXISTING LIGHT FIXTURE TO BE DISCONNECTED AND REMOVED OR RELOCATED TO SUIT NEW LAYOUT.
	WALL MOUNTED SWITCH - M.H. 1200mm A.F.F.
	EMERGENCY BATTERY UNIT C/W RECEPTACLE AND LIGHTING HEADS
	REMOTE EMERGENCY LIGHTING DUAL HEAD - CEILING MOUNTED
	FIRE ALARM CONTROL PANEL
	FIRE ALARM HEAT DETECTOR, R57°C
	FIRE ALARM AUDIBLE DEVICE
	FIRE ALARM STROBE LIGHT
	BARRIER-FREE DOOR OPERATOR C/W PUSHBUTTONS
	DUPLEX RECEPTACLE
	OVER COUNTER DUPLEX RECEPTACLE GFI = GROUND FAULT
	MANUAL MOTOR STARTER - CSA CERTIFIED AS A DISCONNECTING MEANS AND LOCKABLE IN THE "OFF" POSITION.
	SPEED SWITCH SUPPLIED BY DIV. 23, INSTALLED & WIRED BY DIV. 26
	SINGLE PHASE ELECTRIC MOTOR
	FLEXIBLE CONDUIT
	DUAL TECHNOLOGY OCCUPANCY SENSOR
	THERMOSTAT BY MECHANICAL
	HUMIDISTAT
	DURESS PUSH BUTTON
	DURESS AUDIBLE ALARM & DOME LIGHT
	ELECTRIC DOOR STRIKE
	OCCUPIED SIGN
	DOOR LOCK
	DIRECT CONNECTION
	SURFACE MOUNTED PANEL

ABBREVIATION LEGEND	
ABBREVIATION	DESCRIPTION
E	EXISTING TO REMAIN
ER	DISCONNECT AND REMOVE

DRAWING LIST	
SYMBOL	DESCRIPTION
E1	ELECTRICAL LEGEND, KEY PLAN, LIGHT FIXTURE SCHEDULE & GENERAL NOTES
E2	ELECTRICAL - EAST GROUND FLOOR POWER, LIGHTING, DEMOLITION & NEW WORK



LIGHTING FIXTURE SCHEDULE							
TYPE	DESCRIPTION	LAMPS PER FIXTURE			VOLT	MOUNTING	REMARKS
		QTY	TYPE	WATTS			
1	610X610mm FLUORESCENT HIGH PERFORMANCE FIXTURE	2	T8	17	3500K	120	RECESSED 95% REFLECTANCE ALUMINUM REFLECTOR
	DIRECT/INDIRECT GRID MOUNTED COFFER TYPE, POWDER COATED WHITE BODY						

**NOTES:**  
1. ALL AGRI LENSES SHALL BE K12 TYPE  
2. ALL FLUORESCENT LAMPS SHALL BE PHILIPS 'ALTO' SERIES, COLOUR TEMPERATURE TO MATCH EXISTING BASEBUILDING STANDARDS.

## GENERAL NOTES

- DEMOLITION NOTES:**
- UNLESS OTHERWISE NOTED, MATERIALS FOR REMOVAL BECOME THE CONTRACTOR'S PROPERTY AND SHALL BE TAKEN FROM SITE AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS AND REGULATIONS.
  - DISCONNECT AND MAKE SAFE ALL SYSTEMS TO BE DEMOLISHED INCLUDING PANELS, FEEDERS, BRANCH CIRCUITS AND EQUIPMENT BY OTHER DIVISIONS. COORDINATE WITH OTHER DIVISIONS.
  - MAINTAIN EXISTING REMAINING CIRCUITS, SYSTEMS, ETC., WHICH PASS THROUGH AREA OF CONSTRUCTION AND IN CLOSE PROXIMITY. PROVIDE NECESSARY COMPONENTS TO MAINTAIN SYSTEMS. ENSURE COMPONENTS WILL BE CONCEALED WHEN CONSTRUCTION IS COMPLETE.
  - REINSTATE IMMEDIATELY ANY REMAINING EXISTING SYSTEMS IN-ADVERTENTLY INTERRUPTED DURING CONSTRUCTION.
  - THE DRAWINGS INDICATE KNOWN CONDITIONS AND MAY NOT INDICATE ALL DEMOLITION REQUIREMENTS. ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO TENDER SUBMISSION AND VERIFY REQUIREMENTS AND INCLUDE ALL COSTS IN TENDER.
  - REMOVE REDUNDANT CONDUIT AND WIRING BACK TO SOURCE UNLESS OTHERWISE NOTED, AND MAKE SAFE.
  - DEVICES FROM DEMOLITION ARE NOT TO BE REUSED UNLESS NOTED OTHERWISE. NEW DEVICES SHALL BE SUPPLIED WHERE NECESSARY.
  - ALL FIRE ALARM DEVICES TO REMAIN IN OPERATION. PROTECT SMOKE DETECTORS FROM DUST EXPOSURE DURING CONSTRUCTION.
  - ENSURE FIRE ALARM SYSTEM IS OPERATIONAL AT THE END OF EACH SHIFT.

- GENERAL NOTES:**
- ELECTRICAL WORK TO BE DONE IN ACCORDANCE WITH THE ELECTRICAL SAFETY CODE OF ONTARIO, AND WITH NEW ARCHITECTURAL/INTERIOR DESIGNER'S LAYOUT (LOCATION/MOUNTING HEIGHTS). CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS, PAY ALL APPLICABLE FEES AND INSPECTION COSTS.
  - COORDINATE WORK WITH ALL OTHER TRADES TO AVOID INTERFERENCE.
  - ENSURE ELECTRICAL COMPONENTS (IE. WIRING, CONDUIT, ETC.) RELATING TO THE AREA OF WORK ARE INDEPENDENTLY SECURED TO COMPLY WITH CODE REQUIREMENTS. IT IS NOT ACCEPTABLE TO SECURE THE COMPONENTS TO DUCTWORK, DUCT WORK TO CONDUIT, OR ANY OTHER SYSTEMS.
  - ENSURE ALL EXISTING CEILING MOUNTED BOXES ARE CLOSED PRIOR TO COMPLETION OF PROJECT. PROVIDE LABELLED AND COLOUR CODED COVER PLATES (IE. PANEL NAME AND CIRCUIT NUMBER) AS REQUIRED.
  - MINIMUM THREE (3) WORKING DAYS PRIOR TO CLOSING CEILING, NOTIFY THE ENGINEER FOR CEILING INSPECTION.
  - CONSTRUCTION PHASING TO BE COORDINATED WITH DEPARTMENT REPRESENTATIVE.

- LIGHTING NOTES:**
- CLEAN LAMPS, LENSES, INTERIOR AND VISIBLE SURFACES OF LUMINAIRES. REPLACE DEFECTIVE LAMPS, BALLAST AND DAMAGED LENSES IN AREA OF CONSTRUCTION.
  - LUMINAIRES IN CONSTRUCTION AREA ARE TO BE INDEPENDENTLY SUPPORTED, INCLUDING EXISTING TO REMAIN, RELOCATED AND NEW, TO COMPLY WITH CODE REQUIREMENTS.
  - ADD, RELOCATE AND CONNECT LIGHT FIXTURES TO SUIT INDICATED LAYOUT, EXTEND CONDUIT AND WIRING AS NECESSARY AND CONNECT LUMINAIRES TO EXISTING CIRCUITS. TURN OVER SURPLUS FIXTURES TO OWNER.

- FIRE ALARM NOTES:**
- TEST FINAL INSTALLATION AND PROVIDE VERIFICATION OF FIRE ALARM SYSTEMS IN ACCORDANCE WITH CAN/ULC S537 LATEST EDITION. VERIFICATION REPORT SHALL INCLUDE MEASURED dB LEVELS.
  - NEW FIRE ALARM SYSTEM COMPONENTS TO MATCH EXISTING BUILDING STANDARDS. PROVIDE NEW CIRCUITS AS REQUIRED FOR AUDIBLE AND ALARM CIRCUITS. EXISTING SYSTEM AS INDICATED.
  - ADJUST FIRE ALARM DEVICE SETTING TO MEET APPLICABLE CODES FOR SOUND LEVELS WITHIN THE AFFECTED SPACE. ADVISE DEPARTMENT REPRESENTATIVE OF ANY ISSUES WHICH ARISE FROM CONFLICT WITH THE CODES PRIOR TO COMMENCING THE WORK. PROVIDE SOUNDER OR BAFFLE AS REQUIRED TO MEET CODE DB LEVELS.

- POWER NOTES:**
- ENSURE EXISTING REMAINING OUTLETS IN AFFECTED AREA ARE FUNCTIONAL.
  - DO NOT MOUNT WALL OUTLETS BACK TO BACK. LEAVE MINIMUM 300mm SPACE BETWEEN OUTLETS. STAGGER OUTLETS WITHIN ALTERNATE STUD CAVITIES. DO NOT ANCHOR BACK TO BACK OUTLETS TO THE SAME STUD.

- COLOR CODING:**  
APPLICABLE TO NEW OR RELOCATED WORK UNLESS OTHERWISE NOTED.
- TO CONFORM TO CLIENT'S BUILDING CODING SYSTEM.
  - COLOUR CODE CONDUITS AND BOXES.
  - CODE WITH PLASTIC TAPE OR PAINT WHERE CONDUITS ENTER WALLS, CEILING, OR FLOOR AND AT 45° INTERVALS.
  - COLOURS: 25mm WIDE PRIME COLOUR AND 19mm WIDE AUXILIARY COLOUR.

SERVICE	PRIME COLOUR	AUXILIARY COLOUR
UP TO 250V	BLUE	
FIRE ALARM	RED	
SECURITY SYSTEM	RED	YELLOW

- OUTLETS LOCATION:**
- EXACT LOCATION AND MOUNTING HEIGHTS OF OUTLETS TO BE COORDINATE WITH INTERIOR DESIGNER/ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN. REFER TO ARCHITECTURAL/DESIGNER DRAWINGS FOR MILLWORK, FURNITURE, SCREENS, COMPONENTS (I.E. TV, DRINKING FOUNTAIN, ETC.) FOR REQUIREMENTS.
  - BRING TO THE ATTENTION OF THE DEPARTMENT REPRESENTATIVE ANY CONFLICTS OR REQUIRED CLARIFICATION.
  - FAILING TO COORDINATE, THE CONTRACTOR WILL MODIFY THE INSTALLATION AT HIS EXPENSE, IF REQUIRED.

- SCHEDULING OF WORK:**
- MAINTAIN POWER, FIRE ALARM AND COMMUNICATION SYSTEM SERVICE INTERRUPTIONS TO A MINIMUM. COORDINATE POWER AND FIRE ALARM INTERRUPTIONS AFTER BUILDING OPERATING HOURS WITH DEPARTMENT REPRESENTATIVE.
  - PROVIDE 4 DAY NOTICE AND OBTAIN WRITTEN APPROVAL FROM END USER FOR ACCEPTABLE DOWN TIME SCHEDULE.

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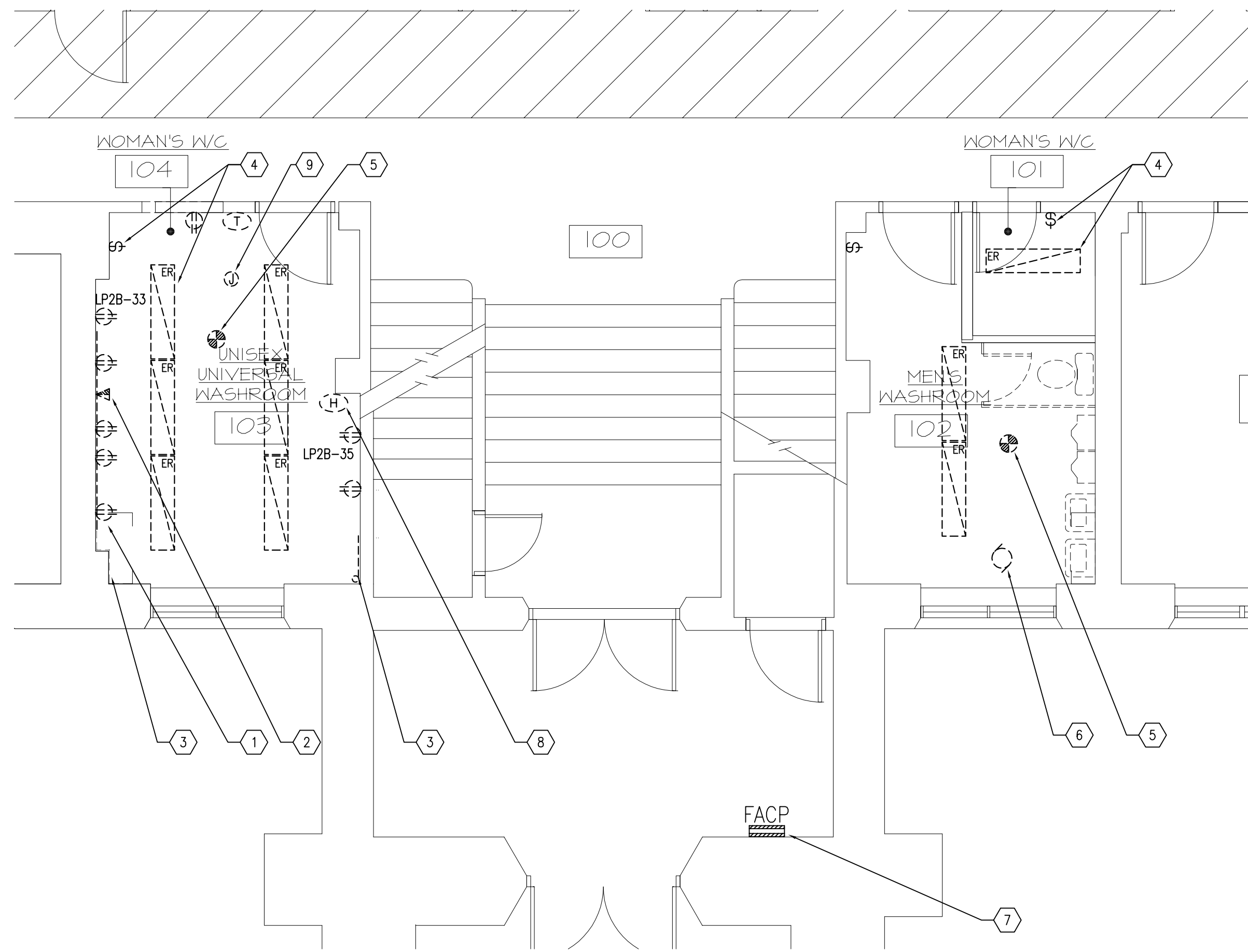
NE PAS MESURER LES DESSINS À L'ÉCHELLE.

Project north Nord du projet	Seal/Scou

Project/Projet  
**AGRICULTURE AND AGRI FOOD CANADA  
BUILDING 49 EAST.**

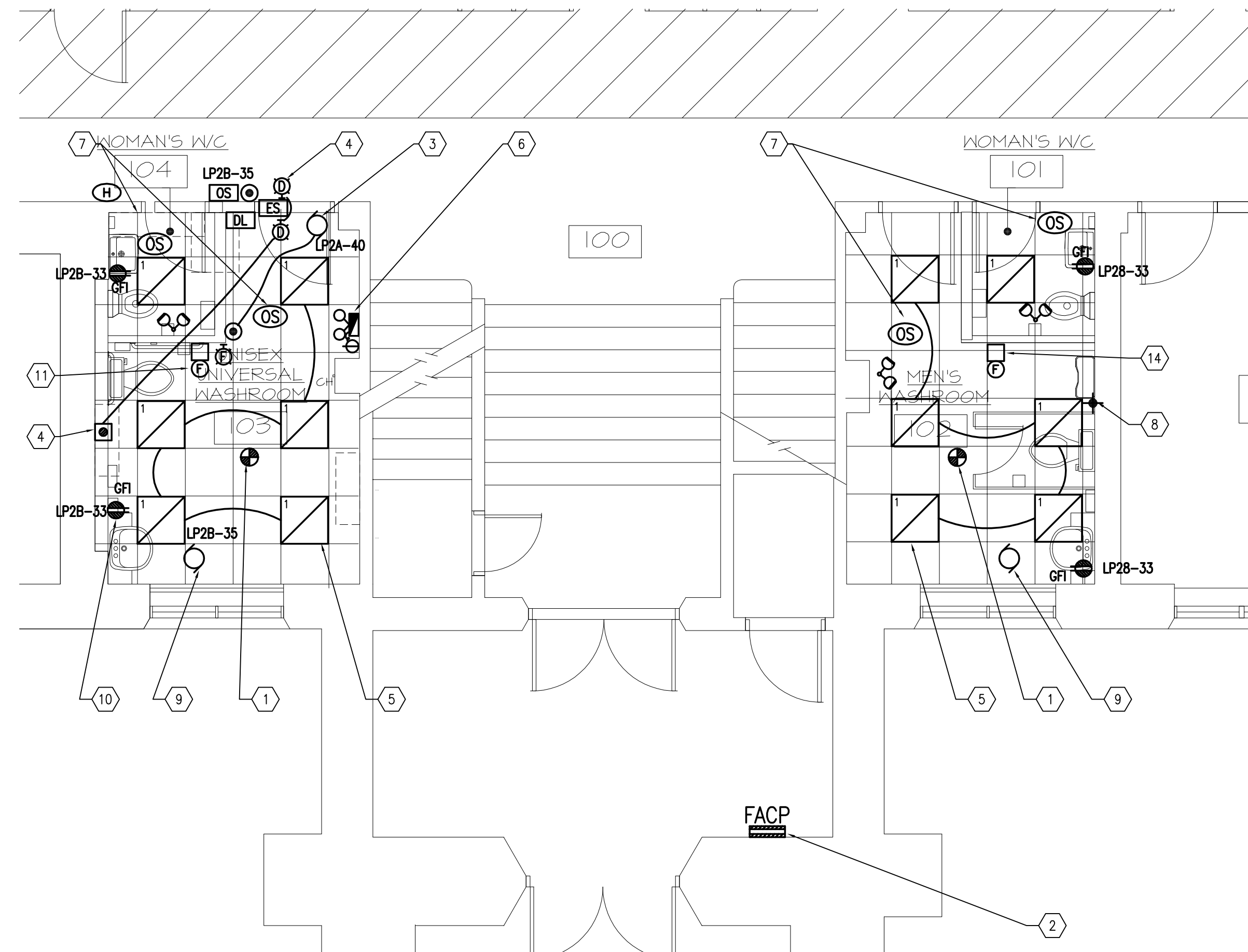
Drawing title/Titre du dessin  
**ELECTRICAL  
LEGEND, KEY PLAN, LIGHT  
FIXTURE SCHEDULE &  
GENERAL NOTES**

Scale Échelle	AS NOTED A654	Project no./No. du projet	
Design by Conçu par	M. TROTTIER	Drawing/Dessin	
Drawn by Dessiné par	M. TROTTIER	<b>E1</b>	
Reviewed by Examiné par	D. VYAS		of 2
Date	OCTOBER 2015	Revision no. Date	0 Z:/2015-476



### 1 DEMOLITION POWER, LIGHTING AND SYSTEMS

E2 1:50

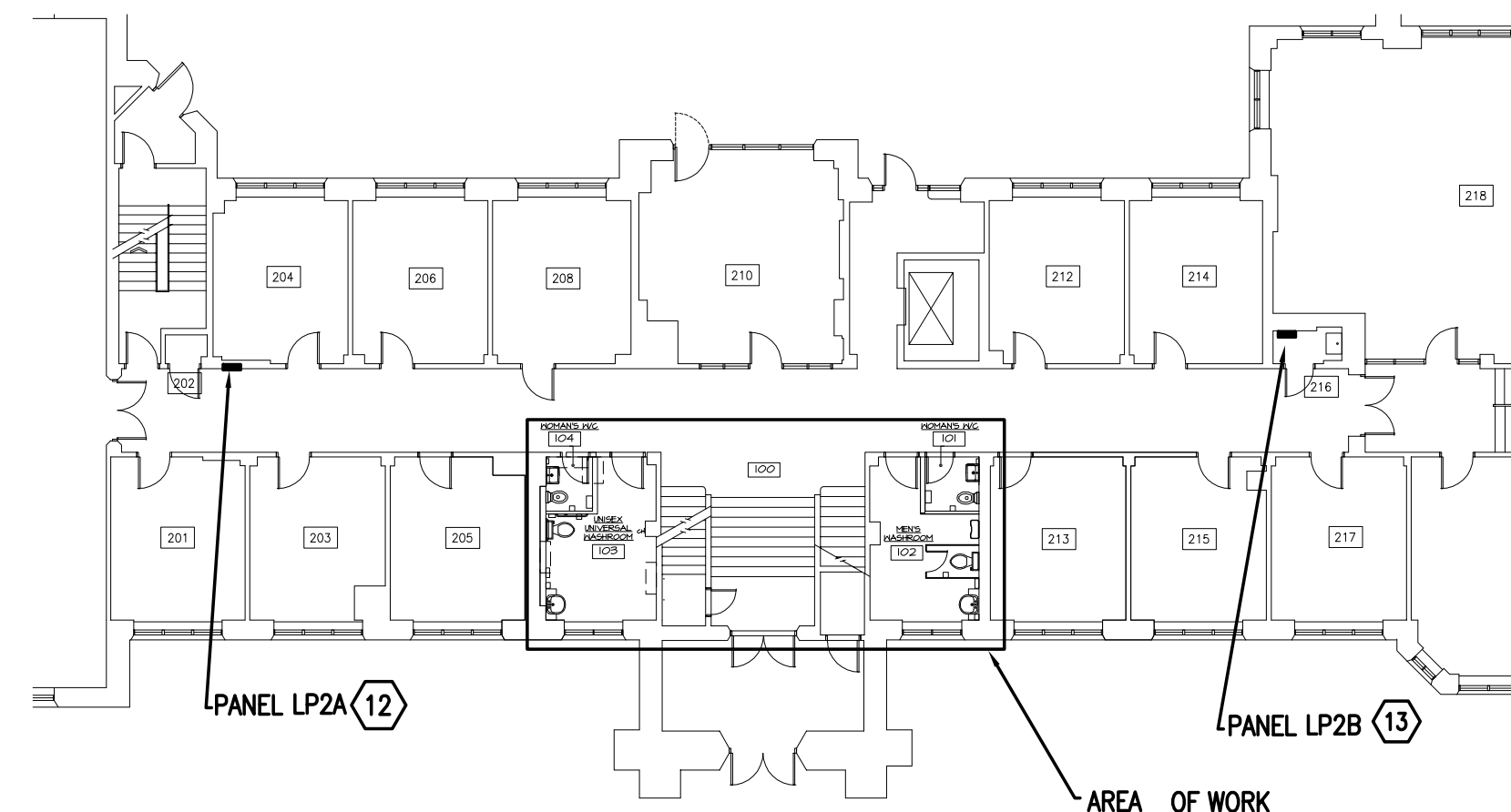


### 2 NEW WORK POWER, LIGHTING AND SYSTEMS

E2 1:50

#### DEMOLITION DRAWING NOTES:

- 1 TYPICAL REMOVE EXISTING RECEPTACLES COMPLETE WITH CONDUITS AND WIRING TO SOURCE OF SUPPLY. IDENTIFY BREAKERS AT PANEL BOARD, REFER TO NEW WORK.
- 2 TYPICAL REMOVE EXISTING COMMUNICATION OUTLET COMPLETE WITH CONDUITS AND WIRING TO SOURCE OF SUPPLY.
- 3 TYPICAL REMOVE EXISTING COMMUNICATION CONDUITS AND WIRING TO SOURCE OF SUPPLY. IDENTIFY AND CONCEAL EXISTING COMMUNICATION WIRING FEEDING ADJACENT ROOM TO REMAIN OPERATIONAL. COORDINATE WITH GENERAL TRADES FOR CUTTING AND PATCHING OF WALLS AND CEILINGS.
- 4 TYPICAL REMOVE EXISTING LIGHT FIXTURE AND SWITCHING COMPLETE WITH WIRING TO NEAREST JUNCTION BOX AND RETAIN CIRCUIT FOR NEW LIGHTING. VERIFY WIRING CONDITION AND REPORT FINDINGS TO DEPARTMENT REPRESENTATIVE.
- 5 EXISTING FIRE ALARM HEAT DETECTOR TO BE REMOVED AND INITIATING CIRCUIT TO BE PROTECTED DURING RENOVATION, REFER TO NEW WORK.
- 6 DISCONNECT EXISTING EXHAUST FAN AND MAKE CIRCUIT SAFE DURING RENOVATION. REFER TO NEW WORK FOR ADDITIONAL REQUIREMENTS.
- 7 EXISTING SIEMENS FIRE ALARM CONTROL PANEL TO REMAIN OPERATIONAL AT ALL TIMES. REFER TO NEW WORK.
- 8 TRACE HUMIDISTAT CONTROL WIRING AND REPORT FINDINGS TO DEPARTMENT REPRESENTATIVE. INCLUDE IN TENDER SUM TO RELOCATE AND RE-INSTATE.
- 9 RELOCATE JUNCTION BOX, CONDUITS AND WIRING TO ACCOMMODATE NEW WASHROOM.



### 3 LOCATION PLAN - NEW WORK

E2 1:150

#### NEW WORK DRAWING NOTES:

- 1 RELOCATE AND REPLACE FIRE ALARM HEAT DETECTOR TO ACCOMMODATE NEW WASHROOM LAYOUT. DETECTOR TO MATCH BASE BUILDING SIEMENS SYSTEM AND RECONNECT TO EXISTING FLOOR ZONE. VERIFY AND UPDATE PROGRAMMING.
- 2 PROVIDE NEW STROBE LIGHT SIGNAL OUTPUT CARD IN EXISTING SIEMENS FIREFINDER FIRE ALARM CONTROL PANEL FOR NEW WASHROOM STROBE LIGHT AND CONNECT BELL TO EXISTING SIGNAL CIRCUIT. FISH AND CONCEAL ALL WIRING IN WALLS AND CEILING SPACE. ALL SYSTEM INTERRUPTIONS, MODIFICATIONS AND VERIFICATION TO BE COMPLETED AFTER BUILDING OPERATING HOURS. COORDINATE WITH DEPARTMENT REPRESENTATIVE AND OBTAIN WRITTEN APPROVAL FOR SYSTEM MODIFICATIONS. PROVIDE SEPARATE UNIT PRICE NOT INCLUDED IN TENDER SUM FOR NEW BELL SIGNAL CIRCUIT OUTPUT CARD.
- 3 PROVIDE 15A 120V AUTO DOOR OPERATOR CONNECTION COMPLETE WITH ALL BACK BOXES FOR AUTO DOOR PUSH BUTTONS. INTERLOCK DOOR STRIKE WITH DURESS SYSTEM.
- 4 EMERGENCY CALL SYSTEM KIT AND DOOR HARDWARE SUPPLIED BY HARDWARE CONTRACTOR. ALL ROUGH-IN BY THIS CONTRACTOR. ROUGH-IN MUSHROOM TYPE PUSH BUTTON, TRANSFORMER, HORN/STROBES AND DOOR CONTROLS. PROVIDE BOXES AND CONDUITS FOR EMERGENCY PUSH BUTTON (SINGLE GANG), HORN/STROBE INSIDE AND OUTSIDE OF DOOR (2 X 100MM BOX), DOOR LOCK SWITCH (SINGLE GANG) AND OCCUPIED SIGN (SINGLE GANG BOX). PROVIDE 21 MM CONDUIT FROM EMERGENCY PUSH BUTTON TO DOME LIGHTS, FROM DOOR LOCK SWITCH FOR RELEASE UPON DURESS ACTIVATION AND AUTO DOOR PUSH BUTTONS TO DOOR OPERATOR. PROVIDE 21mm CONNECTING CONDUITS BETWEEN DEVICES. DOOR OPERATOR, AUTO DOOR PUSH BUTTONS, DOOR LOCK SWITCH, OCCUPIED SIGN. DOOR OPERATION SEQUENCE SHALL BE AS DIRECTED BY MANUFACTURER. CO-ORDINATE DEVICE LOCATIONS WITH ARCHITECTURAL DRAWING. PROVIDE DEDICATED CIRCUIT AND BREAKER FOR EQUIPMENT AND FEED FROM EXISTING PANEL. ALL CONDUITS TO BE COMPLETE WITH PULL CORDS.
- 5 TYPICAL PROVIDE LIGHT FIXTURE AS IDENTIFIED IN LIGHTING FIXTURE SCHEDULE AND CONNECT TO EXISTING CIRCUIT.
- 6 PROVIDE 100W EMERGENCY BATTERY UNIT C/W REMOTE LIGHTING HEADS AND CONNECT TO ROOM LIGHTING CIRCUIT.
- 7 PROVIDE WALL OR CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSORS COMPLETE WITH RELAYS AND POWER PACK TO CONTROL LIGHTING SEPARATELY AND EXHAUST FAN FROM TWO SENSOR. OCCUPANCY SENSOR TO SHUT OFF FAN AND LIGHTS WHEN AREA IS NOT OCCUPIED FOR MORE THEN 30 MINUTES.
- 8 PLUMBING AUTO FLUSH CONTROL TRANSFORMER IN WALL SUPPLIED BY MECHANICAL, INSTALLED BY ELECTRICAL. FEED FROM RECEPTACLE CIRCUIT AND CONFIRM EXACT LOCATION WITH MECHANICAL CONTRACTOR.
- 9 EXHAUST FAN CONNECTION 300W 120V TO BE CONTROLLED FROM TWO WASHROOM OCCUPANCY SENSORS. RE-FEED FROM EXISTING CIRCUIT WHERE AVAILABLE AND FROM NEW AS INDICATED.
- 10 TYPICAL PROVIDE GROUND FAULT RECEPTACLES AND MOUNT OVER COUNTER, REFER TO SPECIFICATIONS FOR MOUNTING HEIGHT. FEED ALL WASHROOM RECEPTACLES FROM ONE DEDICATED 15A CIRCUIT, PROVIDE SPLIT BREAKER AS REQUIRED, REFER TO DEMOLITION.
- 11 PROVIDE NEW FIRE ALARM DEVICES IN COMBINATION BELL/STROBE BOX AND COORDINATE VERIFICATION WITH DEPARTMENT REPRESENTATIVE.
- 12 PROVIDE NEW 15A 1P BREAKER IN EXISTING SQUARE D QBL PANEL TO ACCOMMODATE NEW DOOR OPERATOR. FISH AND CONCEAL WIRING IN CEILING SPACE.
- 13 EXISTING SQUARE D QBL PANEL TO REMAIN OPERATIONAL. RE-USE EXISTING BREAKERS FOR NEW EQUIPMENT AS INDICATED.
- 14 PROVIDE NEW FIRE ALARM BELL AND CONNECT TO SIGNAL CIRCUIT, COORDINATE VERIFICATION WITH DEPARTMENT REPRESENTATIVE.

Client

DATE	REVISION	REF
NOV. 13, 2015	ISSUED FOR TENDER	0
OCT. 30, 2015	ISSUED FOR 99% REVIEW	-

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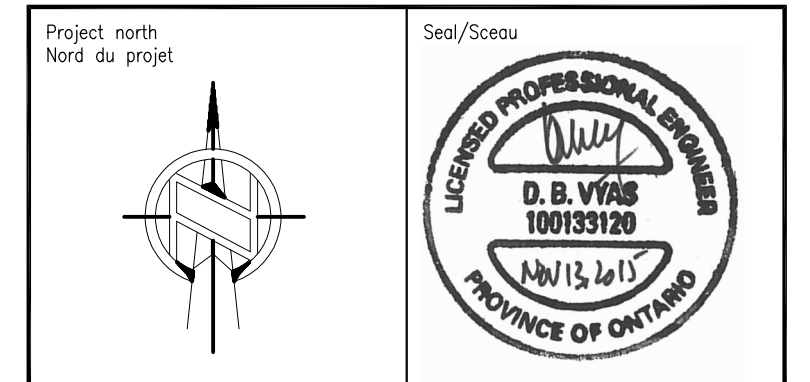
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## AGRICULTURE AND AGRI FOOD CANADA BUILDING 49 EAST.

### ELECTRICAL - EAST GROUND FLOOR - POWER, LIGHTING, DEMOLITION & NEW WORK

Scale / Échelle	AS NOTED	Project no./No. du projet	A654
Design by / Conçu par	M. TROTIER	Drawing/Dessin	E2
Drawn by / Dessiné par	M. TROTIER	Reviewed by / Examiné par	D. VYAS
Date	OCTOBER 2015	Revision no.	0
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