

INVITATION TO TENDER

RETURN BIDS TO:

Bid Receiving / Agriculture and Agri-Food Canada

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

TENDER TO:

Agriculture and Agri-Food Canada

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

Comments

ISSUING OFFICE

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

Title Bui l di ng 73 Renovati ons		
Solicitation No. 01B46-15-0213		Date 2015-12-10
Client Reference No. 1516-144110-P13		
File No. 01B46-15-0213		
Solicitation Closes: Friday, January 8, 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: Jean-François Lemay		
Title: Contractual Agent		
Email: j ean-francoi s. l emay@agr. gc. ca		
Telephone Number	Ext.	Fax Number
514 315-6196		514 283-1918
Destination Agriculture and Agri -Food Canada Harrow Research and Development Centre 2585 County Road 20 Harrow, Ontario, NOR 1G0		

Instructions: See Herein

Delivery Required March 15, 2016	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 _____



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Forms

- Bid Bond
- Certificate of Insurance
- Labour and Material Payment Bond
- Performance Bond
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Appendix "A"

GENERAL INSTRUCTIONS TO BIDDERS

GENERAL INSTRUCTIONS TO BIDDERS

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GI01 COMPLETION OF BID

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

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

GI02 IDENTITY OR LEGAL CAPACITY OF THE BIDDER

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

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

GI03 APPLICABLE TAXES

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

GI04 CAPITAL DEVELOPMENT AND REDEVELOPMENT CHARGES

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

GI05 REGISTRY AND PRE-QUALIFICATION OF FLOATING PLANT

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

GI06 LISTING OF SUBCONTRACTORS AND SUPPLIERS

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

GI07 BID SECURITY REQUIREMENTS

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

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

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

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

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

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

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

GI08 SUBMISSION OF BID

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

GI09 REVISION OF BID

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

GI10 REJECTION OF BID

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

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

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

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

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

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

GI11 BID COSTS

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

GI12 COMPLIANCE WITH APPLICABLE LAWS

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

GI13 APPROVAL OF ALTERNATIVE MATERIALS

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

GI14 CONFLICT OF INTEREST - UNFAIR ADVANTAGE

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

GENERAL INSTRUCTIONS TO BIDDERS (Continued)

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



Appendix "B"

SPECIAL INSTRUCTIONS TO BIDDERS

SPECIAL INSTRUCTIONS TO BIDDERS (SI)

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

SI01 BID DOCUMENTS

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

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

SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

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

SI03 NON-MANDATORY SITE VISIT

- 1) There will be a site visit on Thursday, December, 17 , 2015 at
11: 30 AM PM EST.

SPECIAL INSTRUCTIONS TO BIDDERS (Continued)

Interested bidders are to meet at:

Agriculture and Agri -Food Canada
Harrow Research and Development Centre
2585 County Road 20
Harrow, Ontario, NOR 1G0

SI04 REVISION OF BID

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

SI05 BID RESULTS

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

SI06 INSUFFICIENT FUNDING

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

SI07 BID VALIDITY PERIOD

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

SPECIAL INSTRUCTIONS TO BIDDERS (Continued)

SI08 CONSTRUCTION DOCUMENTS

- 1) The successful contractor will be provided with one paper copy of the sealed and signed plans, the specifications and the amendments upon acceptance of the offer. Additional copies, up to a maximum of 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§ion=text#appL>

Canadian economic sanctions

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

SI10 PERSONNEL SECURITY REQUIREMENTS

- 1) The successful Bidder's personnel, as well as any subcontractor and its personnel, who are required to perform any part of the work pursuant to the subsequent contract, must meet the following contract security requirements:
 - Unscreened personnel may be used for the work. Unscreened personnel will require an escort provided by AAFC.



Appendix "C"

BID AND ACCEPTANCE FORM



BID AND ACCEPTANCE FORM

CONSTRUCTION CONTRACT - MAJOR WORKS

BA01 IDENTIFICATION					
Description of the Work Work involves the architectural and structural renovation of a former general storage building into two level soil sample storage building.					
Solicitation Number 01B46-15-0213			File / Project Number 1516-144110-P13		
BA02 BUSINESS NAME AND ADDRESS OF BIDDER					
Name					
Address					
Unit/Suite/Apt.	Street number	Number suffix	Street name	Street type	Street direction
PO Box or Route Number			Municipality (City, Town, etc.)	Province	Postal code
Phone number		Fax number		Email address	
BA03 THE OFFER					
1) The Bidder offers to Canada as represented by the Minister of Agriculture and Agri-food Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the Total Bid Amount of: \$ _____ excluding Applicable Taxes (GST/HST/QST). (to be expressed in numbers only)					
BA04 BID VALIDITY PERIOD					
1) The bid shall not be withdrawn for a period of <u>60</u> days following the date of solicitation closing.					
BA05 APPENDICES					
1) The following appendices are included in this Bid and Acceptance Form: <input checked="" type="checkbox"/> Appendix 2					
BA06 ACCEPTANCE AND CONTRACT					
1) Upon acceptance of the Bidder's offer by Canada, a binding Contract shall be formed between Canada and the resulting Contractor. The documents forming the Contract shall be the contract documents referred to in SC01 CONTRACT DOCUMENTS.					
BA07 CONSTRUCTION TIME					
1) The Contractor shall perform and complete the Work <u>on or before</u> <u>2016-03-15</u>					
BA08 BID SECURITY					
1) The Bidder shall enclose bid security with its bid in accordance with GI07 BID SECURITY REQUIREMENTS.					
2) If a security deposit is furnished as bid security, it shall be forfeited in the event that the bid is accepted by Canada and the Contractor fails to provide Contract Security in accordance with GC9 CONTRACT SECURITY, provided that Canada may, if it is in the public interest, waive the right of Canada to forfeiture any or all of the security deposit.					

BA09 SIGNATURE

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

	Signature _____ Date _____
	Name
	Title

	Signature _____ Date _____

BID AND ACCEPTANCE FORM
CONSTRUCTION CONTRACT - MAJOR WORKS
APPENDIX 2

LIST OF SUBCONTRACTORS

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

LIST OF EQUIPMENT

N/A

LIST OF MATERIALS

N/A



Appendix "D"

MAJOR WORKS - GENERAL CONDITIONS



MAJOR WORKS – GENERAL CONDITIONS

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MAJOR WORKS GENERAL CONDITIONS FORM AAFC 5321:

Revision Date

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

GC1 GENERAL PROVISIONS

- 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
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GC1.1 INTERPRETATION

GC1.1.1 Headings and References

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

GC1.1.2 Terminology

- 1) In the Contract

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

"Work" means, subject only to any express stipulation in the Contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contract in accordance with the contract documents; and

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

GC1.1.3 Application of Certain Provisions

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

GC1.1.4 Substantial Performance

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

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

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

GC1.1.5 Completion

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

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

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

GC1.2.2 Order of Precedence

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

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

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

GC1.2.3 Security and Protection of Documents and Work

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

GC1.3 STATUS OF THE CONTRACTOR

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

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

GC1.4 RIGHTS AND REMEDIES

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

GC1.5 TIME OF THE ESSENCE

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

GC1.6 INDEMNIFICATION BY THE CONTRACTOR

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

GC1.7 INDEMNIFICATION BY CANADA

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

GC1.8 LAWS, PERMITS AND TAXES

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

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

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

GC1.9 WORKERS' COMPENSATION

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

GC1.10 NATIONAL SECURITY

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

GC1.11 UNSUITABLE WORKERS

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

GC1.12 PUBLIC CEREMONIES AND SIGNS

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

GC1.13 CONFLICT OF INTEREST

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

GC1.14 AGREEMENTS AND AMENDMENTS

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

GC1.15 SUCCESSION

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

GC1.16 ASSIGNMENT

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

GC1.17 NO BRIBE

- 1) The Contractor represents and covenants that no bribe, gift, benefit, nor other inducement has been nor shall be paid, given, promised or offered directly or indirectly to any official or employee of Canada or to a member of the family of such a person, with a view to influencing the entry into the Contract or the administration of the Contract.

GC1.18 CERTIFICATION - CONTINGENCY FEES

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

GC1.19 INTERNATIONAL SANCTIONS

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

GC2 ADMINISTRATION OF THE CONTRACT

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

GC2.1 DEPARTMENTAL REPRESENTATIVE'S AUTHORITY

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

GC2.2 INTERPRETATION OF CONTRACT

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

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

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

GC2.3 NOTICES

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

GC2.4 SITE MEETINGS

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

GC2.5 REVIEW AND INSPECTION OF WORK

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

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

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

GC2.6 SUPERINTENDENT

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

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

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

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

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

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

GC2.8 ACCOUNTS AND AUDITS

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

GC3 EXECUTION AND CONTROL OF THE WORK

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

GC3.1 PROGRESS SCHEDULE

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

GC3.2 ERRORS AND OMISSIONS

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

GC3.3 CONSTRUCTION SAFETY

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

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

GC3.4 EXECUTION OF THE WORK

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

GC3.5 MATERIAL

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

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

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

GC3.6 SUBCONTRACTING

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

GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS

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

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

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

GC3.8 LABOUR

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

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

GC3.9 TRUCK HAULAGE RATES

CANCELLED

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

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

GC3.11 DEFECTIVE WORK

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

GC3.12 CLEANUP OF SITE

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

GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

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

GC4 PROTECTIVE MEASURES

GC4.1 PROTECTION OF WORK AND PROPERTY

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

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

GC4.4 CONTAMINATED SITE CONDITIONS

GC4.1 PROTECTION OF WORK AND PROPERTY

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

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

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

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

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

GC4.4 CONTAMINATED SITE CONDITIONS

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

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

GC5 TERMS OF PAYMENT

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

GC5.1 INTERPRETATION

In these Terms of Payment

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

GC5.2 AMOUNT PAYABLE

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

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

GC5.3 INCREASED OR DECREASED COSTS

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

GC5.4 PROGRESS PAYMENT

- 1) On the expiration of a payment period, the Contractor shall deliver to Canada
 - (a) a written progress claim in a form acceptable to Canada that fully describes any part of the Work that has been completed, and any Material that was delivered to the Work site but not incorporated into the Work, during that payment period, and
 - (b) a completed and signed statutory declaration containing a declaration that, up to the date of the progress claim, the Contractor has complied with all lawful obligations with

respect to the Labour Conditions and that, in respect of the Work, all lawful obligations of the Contractor to its Subcontractors and Suppliers, referred to collectively in the declaration as “subcontractors and suppliers”, have been fully discharged.

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

GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK

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

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

whichever is later.

GC5.6 FINAL COMPLETION

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

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

whichever is later.

GC5.7 PAYMENT NOT BINDING ON CANADA

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

GC5.8 CLAIMS AND OBLIGATIONS

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

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

GC5.9 RIGHT OF SETOFF

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

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

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

GC5.10 ASSESSMENTS AND DAMAGES FOR LATE COMPLETION

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

GC5.11 DELAY IN MAKING PAYMENT

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

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

GC5.12 INTEREST ON SETTLED CLAIMS

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

GC5.13 RETURN OF SECURITY DEPOSIT

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

GC6 DELAYS AND CHANGES IN THE WORK

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

GC6.1 CHANGES IN THE WORK

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

GC6.2 CHANGES IN SUBSURFACE CONDITIONS

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

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

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

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

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

GC6.4 DETERMINATION OF PRICE

GC6.4.1 Price Determination Prior to Undertaking Changes

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

GC6.4.2 Price Determination Following Completion of Changes

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

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

GC6.4.3 Price Determination - Variations in Tendered 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
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GC8.1 INTERPRETATION

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

GC8.2 CONSULTATION AND CO-OPERATION

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

GC8.3 NOTICE OF DISPUTE

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

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

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

GC8.4 NEGOTIATION

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

GC8.5 MEDIATION

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

GC8.6 CONFIDENTIALITY

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

GC8.7 SETTLEMENT

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

GC8.8 RULES FOR MEDIATION OF DISPUTES

GC8.8.1 Interpretation

In these Rules

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

GC8.8.2 Application

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

GC8.8.3 Communication

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

GC8.8.4 Appointment of Project Mediator

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

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

GC8.8.5 Confidentiality

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

GC8.8.6 Time and Place of Mediation

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

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

GC8.8.7 Representation

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

GC8.8.8 Procedure

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

GC8.8.9 Settlement Agreement

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

GC8.8.10 Termination of Mediation

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

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

GC8.8.11 Costs

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

GC8.8.12 Subsequent Proceedings

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

GC9 CONTRACT SECURITY

GC9.1 OBLIGATION TO PROVIDE CONTRACT SECURITY

GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY

GC9.1 OBLIGATION TO PROVIDE CONTRACT SECURITY

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

GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY

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

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

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

GC10 INSURANCE

GC10.1 INSURANCE CONTRACTS

GC10.2 INSURANCE PROCEEDS

GC10.1 INSURANCE CONTRACTS

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

GC10.2 INSURANCE PROCEEDS

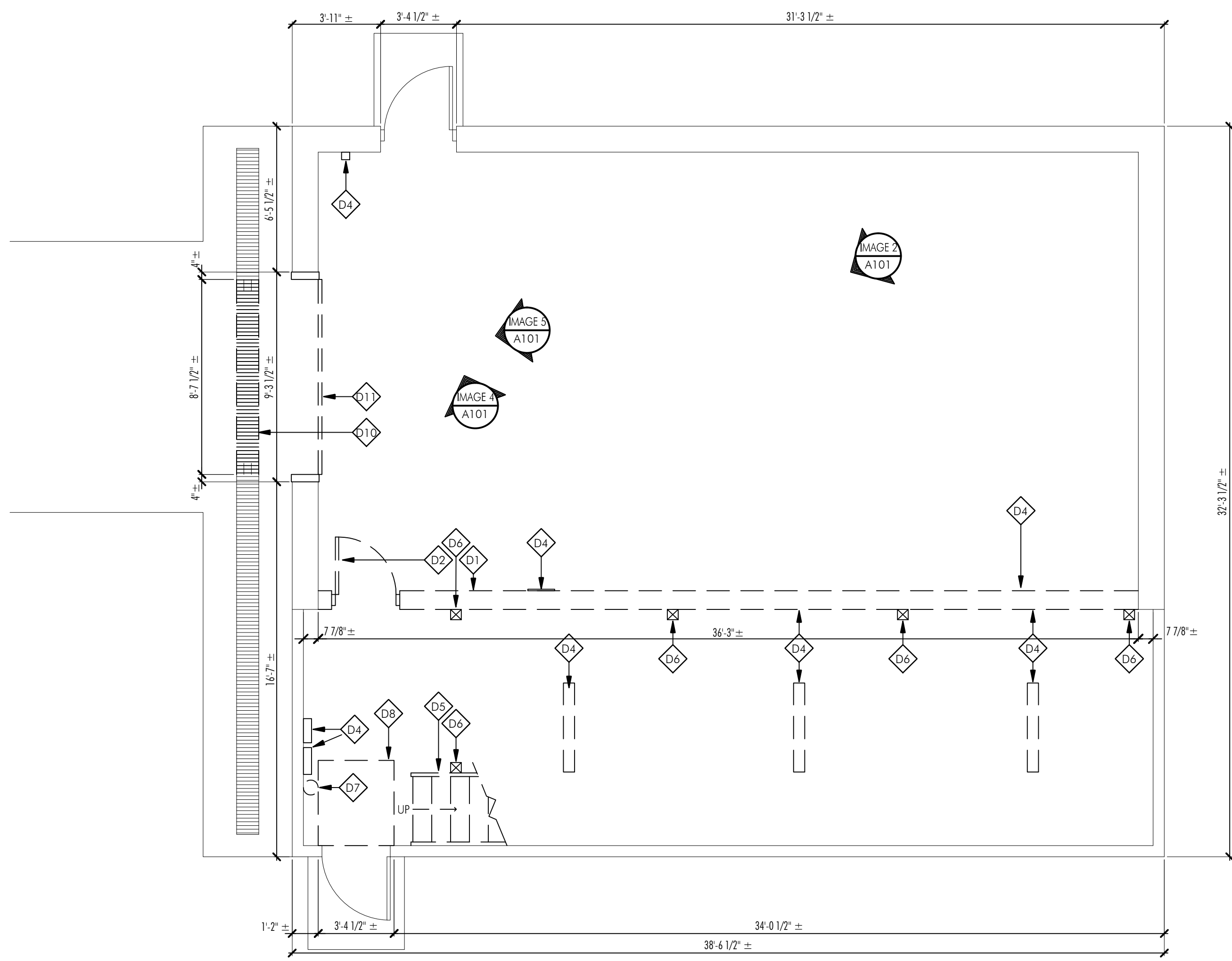
- 1) In the case of a claim payable under a Builders Risk/Installation (All Risks) insurance contract maintained by the contractor pursuant to GC10.1 INSURANCE CONTRACTS, the proceeds of the claim shall be paid directly to Canada, and
 - (a) the monies so paid shall be held by Canada for the purposes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

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

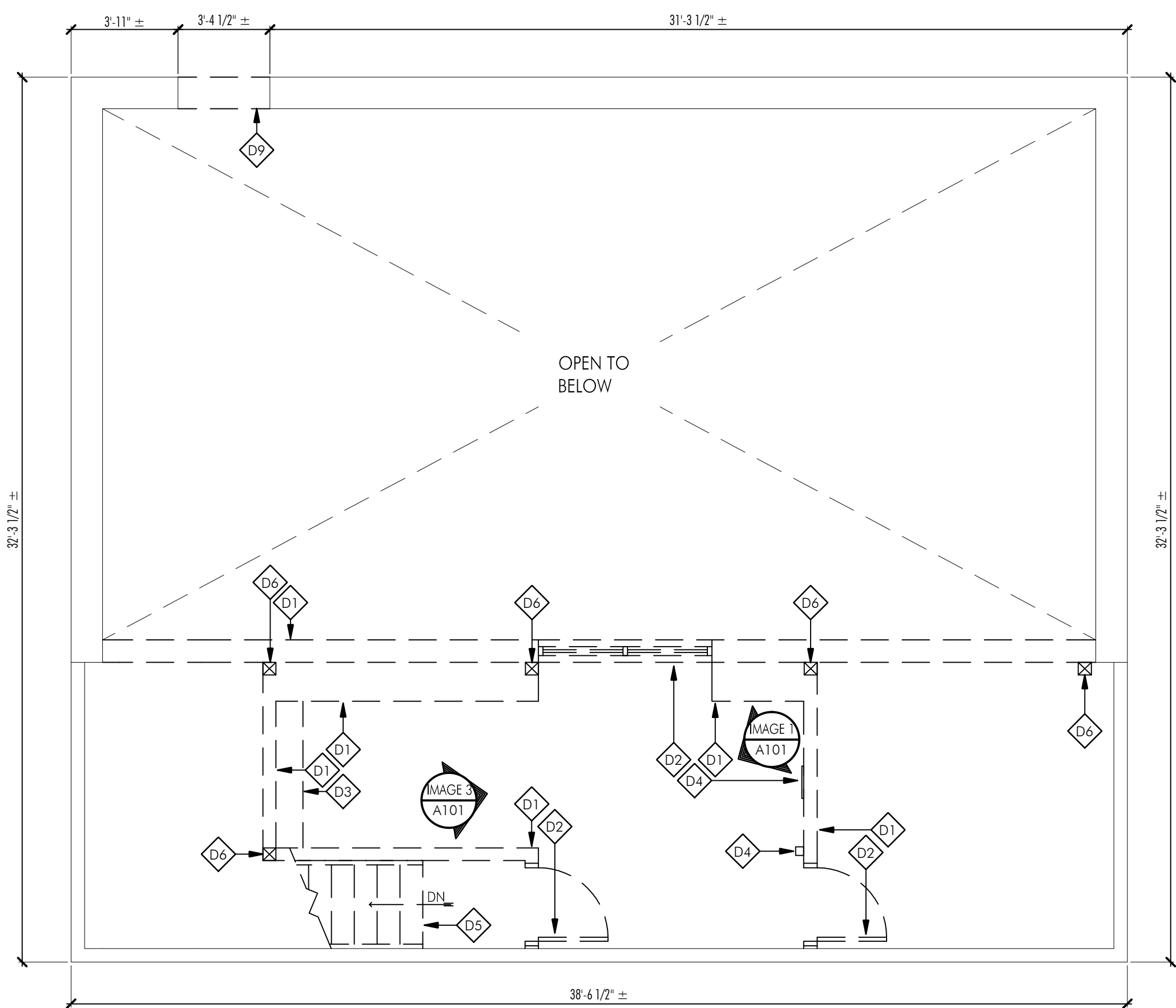


Appendix "E"

TECHNICAL SPECIFICATIONS & PLANS



FIRST FLOOR PLAN - DEMOLITION
SCALE: 1/4" = 1'-0"



MEZZANINE PLAN - DEMOLITION
SCALE: 1/4" = 1'-0"

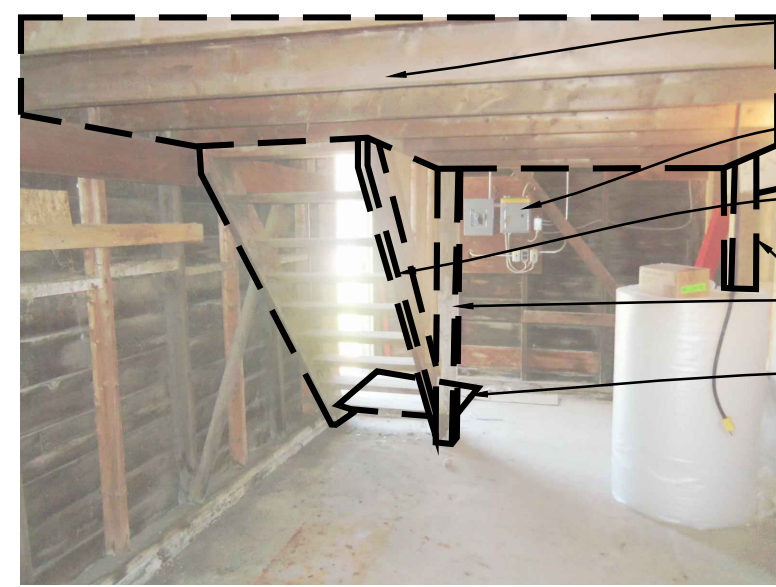


IMAGE - 1
SCALE: N.T.S.

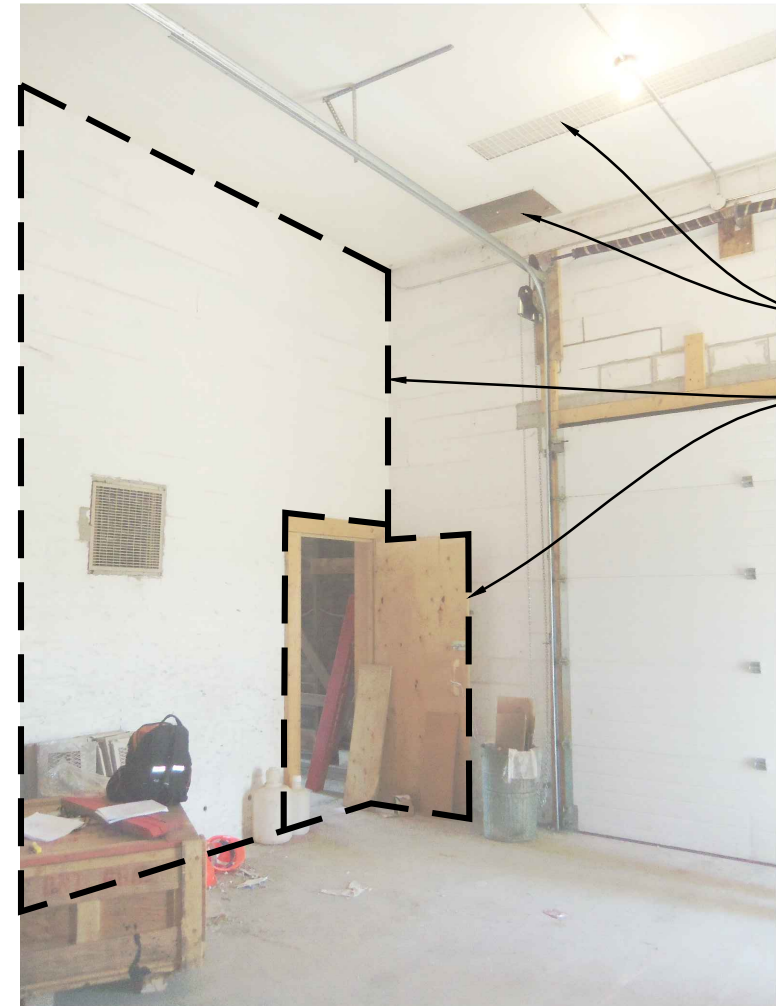


IMAGE - 2
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DEMOLITION LEGEND:

- D1 REMOVE EXISTING PARTITION WALL (REFER TO STRUCTURAL DRAWINGS BEFORE DEMOLITION). PATCH AND REPAIR AS REQUIRED. EXISTING FOUNDATION TO BE CUT TO A MINIMUM 24" BELOW EXISTING FLOOR SLAB.
- D2 EXISTING DOOR / WINDOW AND ALL COMPONENT TO BE REMOVE COMPLETELY.
- D3 REMOVE ALL EXISTING SHELVING UNITS. COORDINATE REMOVAL OF ANY MECHANICAL OR ELECTRICAL INTERFERENCE WITH OWNER PRIOR TO REMOVAL.
- D4 OWNER TO REMOVE EXISTING ELECTRICAL AND MECHANICAL COMPONENTS. COORDINATE REMOVALS WITH DEMOLITION WORK AND GENERAL CONTRACTOR.
- D5 REMOVE EXISTING WOOD STAIR STRUCTURE COMPLETELY (REFER TO STRUCTURAL DRAWINGS BEFORE DEMOLITION).
- D6 REMOVE EXISTING WOOD COLUMN PROVIDE TEMPORARY SHORING AS NOTED ON STRUCTURAL DRAWINGS.
- D7 CLIENT TO DISCONNECT FIRE ALARM PULL STATION AND PORTABLE FIRE EXTINGUISHER PRIOR TO DEMOLITION COORDINATE WITH GENERAL CONTRACTOR.
- D8 REMOVE EXISTING CONCRETE RAMP TO MATCH EXISTING FLOOR.
- D9 REMOVE ALL EXISTING CONSTRUCTION REQUIRED TO CREATE OPENING FOR NEW DOOR. CONTRACTOR TO COORDINATE WITH OTHER SERVICES.
- D10 PORTION OF EXISTING FLOOR DRAIN GRATE TO REMOVED. DRAINAGE PAN TO REMAIN.
- TO BE REMOVED.

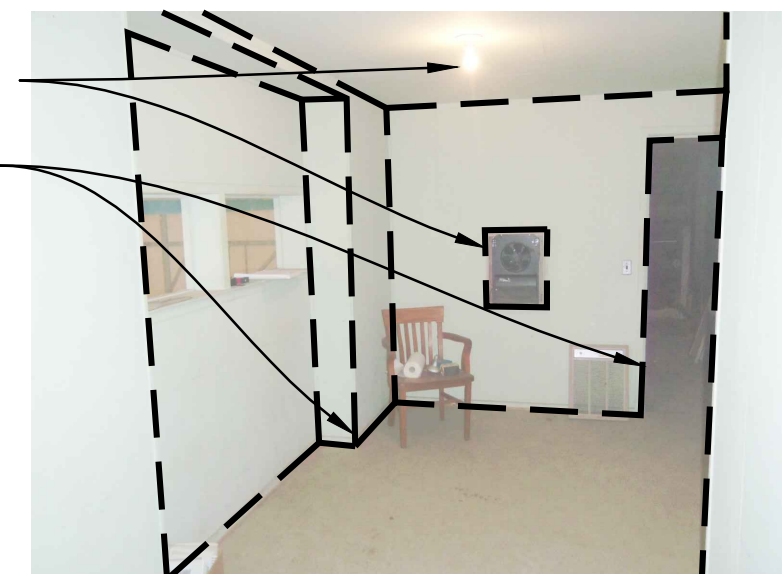


IMAGE - 3
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DEMOLITION NOTES:

- 1) CONTRACTOR SHALL VISIT THE SITE PRIOR TO THE COMMENCEMENT OF ANY WORK TO DETERMINE THE EXTENT OF DEMOLITION AND ALLOW FOR A SAFE WORK ENVIRONMENT.
 - 2) ANY DEMOLITION WORK IN THE EXISTING BUILDING SHALL BE CARRIED OUT WITH CAUTION TO PREVENT ANY DAMAGE TO THE EXISTING STRUCTURE. IF DAMAGE OCCURS, THE CONTRACTOR SHALL REPAIR TO MATCH EXISTING.
 - 3) CONTRACTOR'S REFUSE BIN TO BE LOCATED AS DIRECTED BY THE OWNER.
 - 4) LOCATE AND VERIFY ALL EXISTING SERVICES AND NOTIFY AUTHORITIES BEFORE WORK BEGINS ON THAT SERVICE. PROTECT AND COVER ALL SERVICES DURING CONSTRUCTION ABOVE AND BELOW THE FLOOR.
 - 5) CONTRACTOR SHALL PROVIDE HOARDING TO PREVENT CONSTRUCTION DEBRIS FROM TRAVEL TO EXISTING FACILITY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE SITE AND BUILDING IS KEPT CLEAN TO THE OWNER'S SATISFACTION. CONTRACTOR TO CLEAN AREA DAILY OF ANY DEBRIS FROM CONSTRUCTION AND DEMOLITION AND LEAVE SITE CLEAN.
 - 6) THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL DEMOLISHED MATERIALS AND EQUIPMENT AS INDICATED.
- GENERAL NOTES:**
- 1) ALL CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ONTARIO BUILDING CODE.
 - 2) ALL WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DO NOT SCALE DRAWINGS. ALL DIMENSIONS TO BE VERIFIED BY CONTRACTOR BEFORE COMMENCING ANY WORK.
 - 3) BEFORE BEGINNING WORK AT THE SITE AND THROUGHOUT THE COURSE OF THE WORK, INSPECT AND VERIFY THE LOCATION AND CONDITION OF EVERY ITEM AFFECTED BY THE WORK UNDER THIS CONTRACT AND REPORT DISCREPANCIES TO THE CONSULTANT BEFORE PROCEEDING.
 - 4) BEFORE BEGINNING WORK, INSPECT THE EXISTING BUILDING AND DETERMINE THE EXTENT OF DEMOLITION TO EXISTING FINISHES, SPECIALTIES, CASEWORK, EQUIPMENT, AND OTHER ITEMS WHICH MUST BE REMOVED IN ORDER TO PERFORM THE WORK UNDER THIS CONTRACT.
 - 5) THE ARCHITECTURAL DRAWINGS SHOW PRINCIPAL AREAS WHERE WORK MUST BE EXECUTED UNDER THIS CONTRACT. INCIDENTAL WORK MAY ALSO BE NECESSARY IN AREAS NOT SHOWN ON THE ARCHITECTURAL DRAWINGS DUE TO CHANGES AFFECTING THE STRUCTURE. SUCH WORK IS ALSO PART OF THIS CONTRACT. INSPECT THOSE AREAS AND ASCERTAIN THE EXTENT OF WORK NEEDED AND DO THAT WORK IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS AT NO ADDITIONAL COST.
 - 6) DO NOT DRILL OR CUT EXISTING JOISTS, BEAMS, COLUMNS, OR OTHER STRUCTURAL ELEMENTS UNLESS SPECIFICALLY INDICATED ON THE STRUCTURE DRAWINGS.
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 - 11) METAL SHELVING TO BE FABRICATED AND SUPPLIED BY A CANADIAN MANUFACTURER.

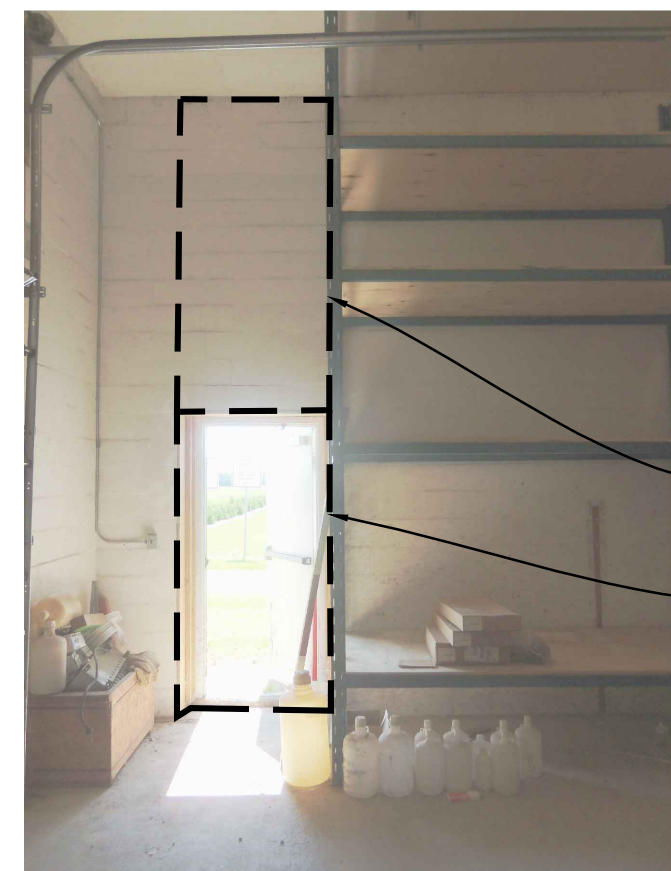


IMAGE - 4
SCALE: N.T.S.

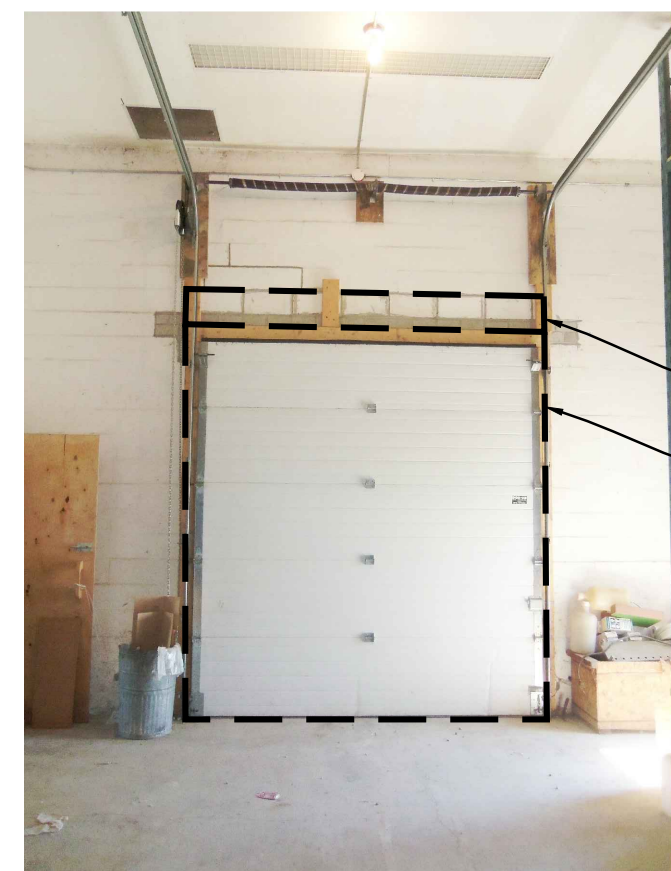
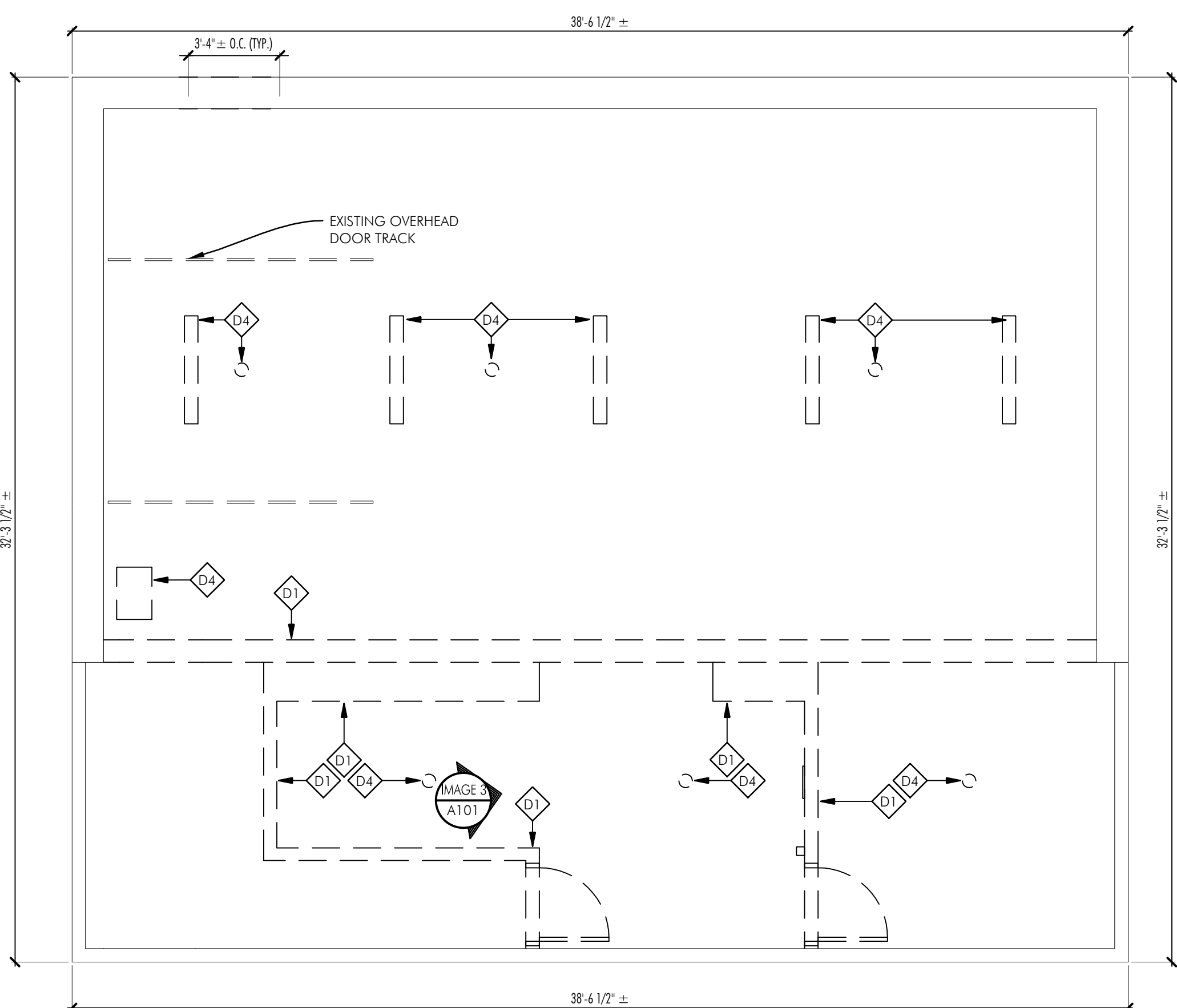


IMAGE - 5
SCALE: N.T.S.



CEILING PLAN - DEMOLITION
SCALE: 1/4" = 1'-0"

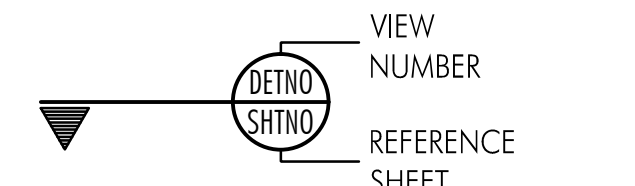
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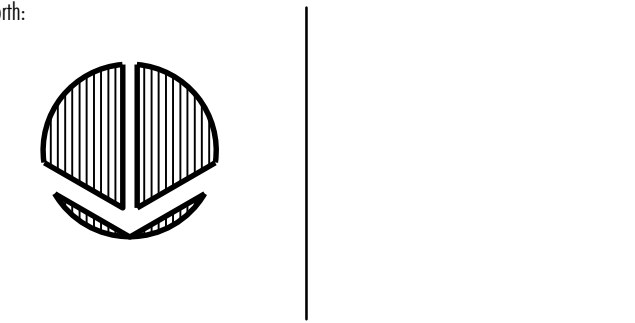


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Fax: (519) 966-6753
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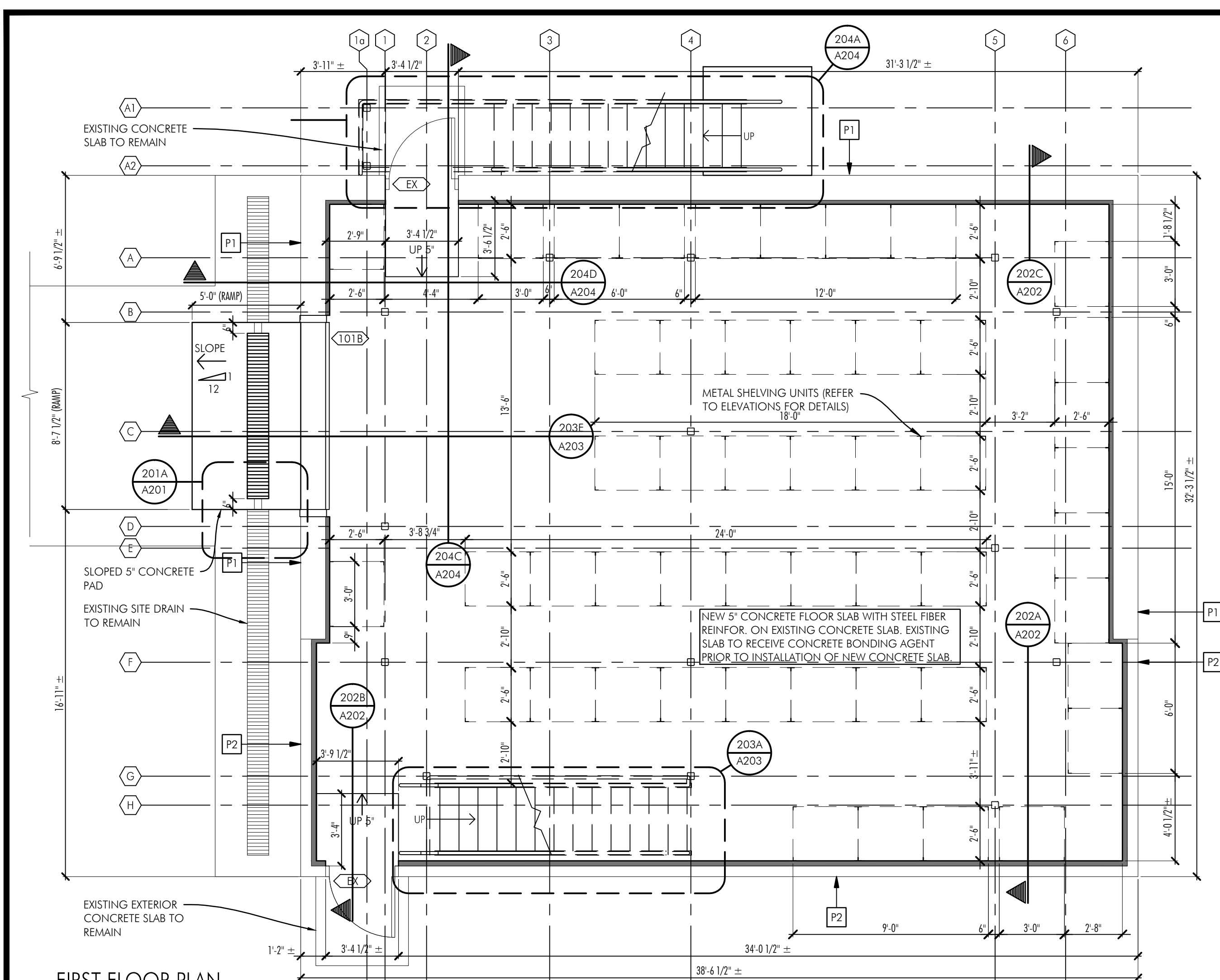
Project Name: **BUILDING #73 RENOVATIONS**
2585 COUNTY ROAD 20
HARROW, ONTARIO

Client: **AGRICULTURE AND AGRI-FOOD CANADA**
HARROW, ONTARIO

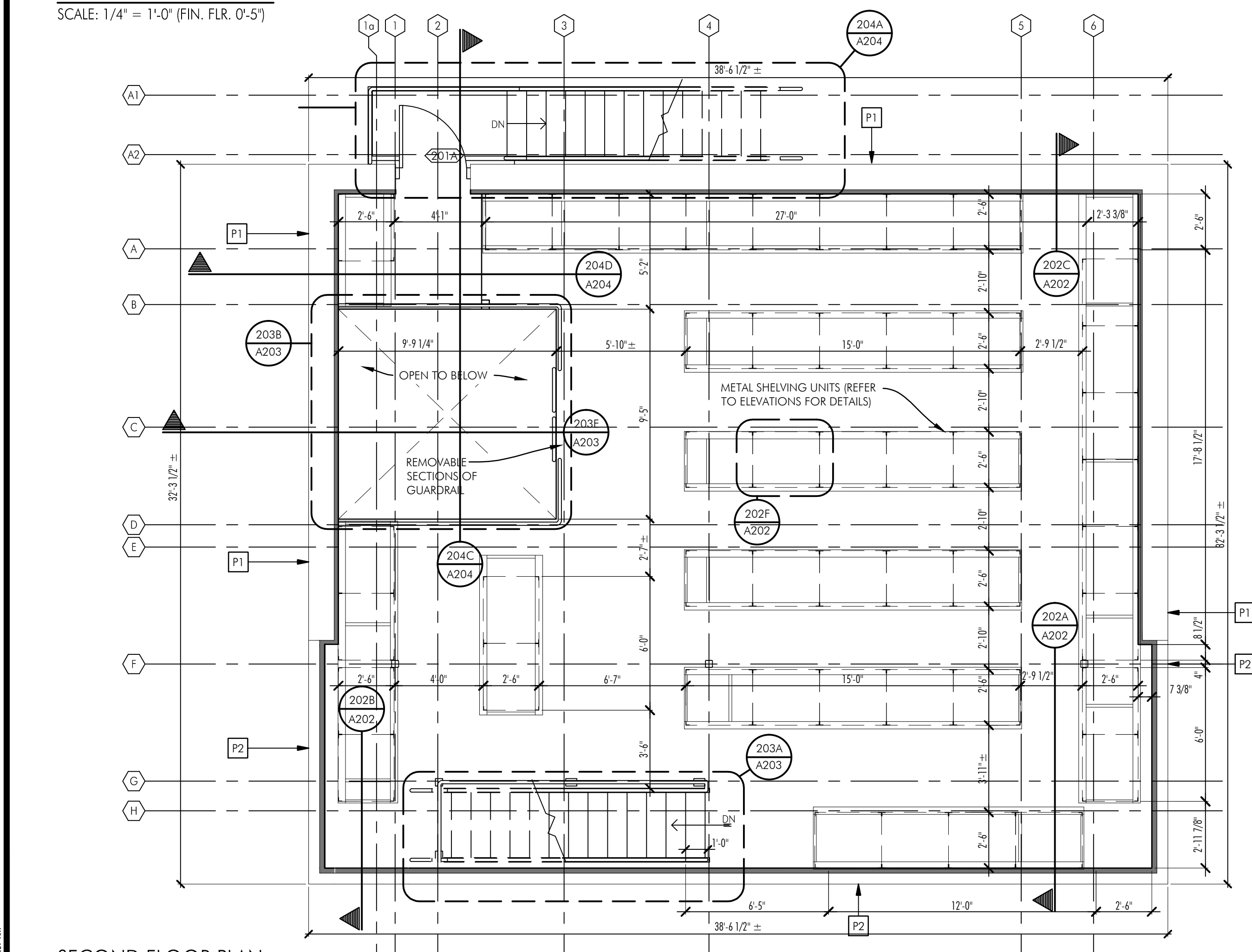
Sheet Title: **DEMOLITION FIRST FLOOR, MEZZANINE AND CEILING PLAN**

Design By: RG
Drawn By: AK
Checked By: RG

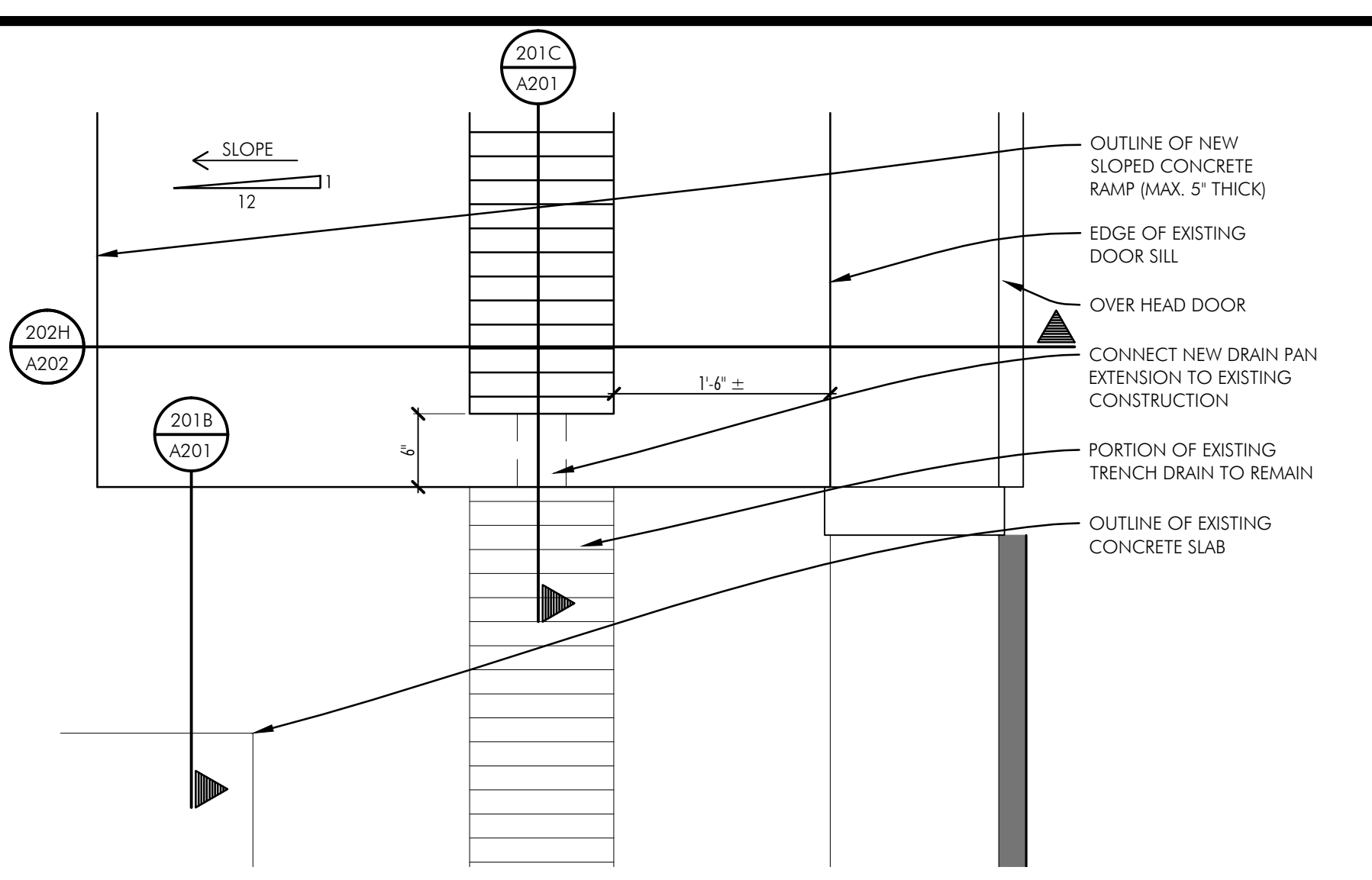
Project No. 15084 | Sheet No. A101



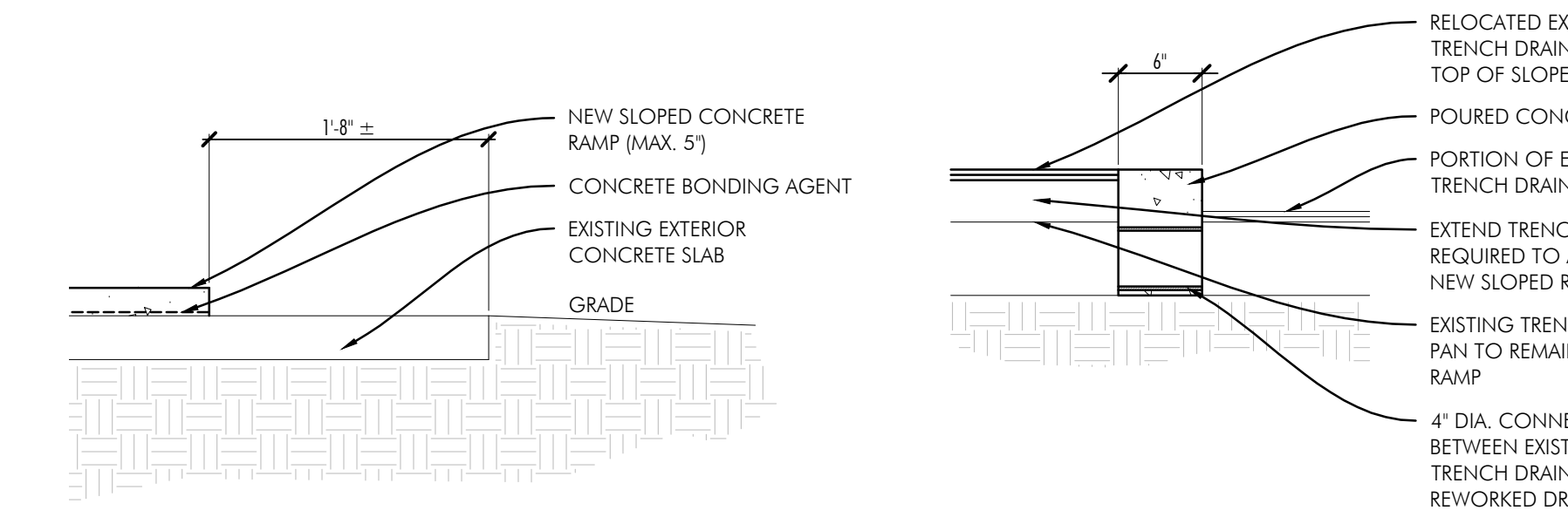
FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0" (FIN. FLR. 0'-5")



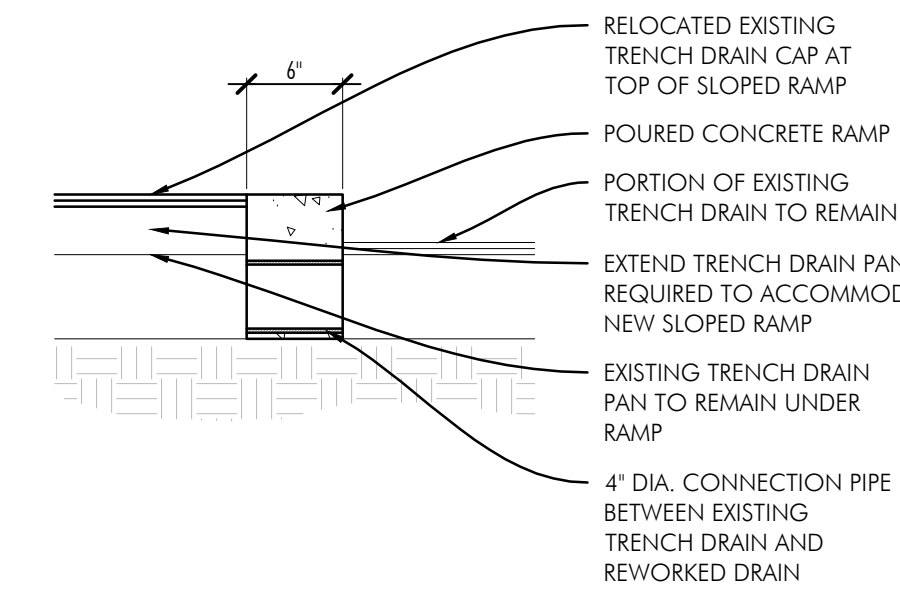
SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0" (FIN. FLR. 8'-9")



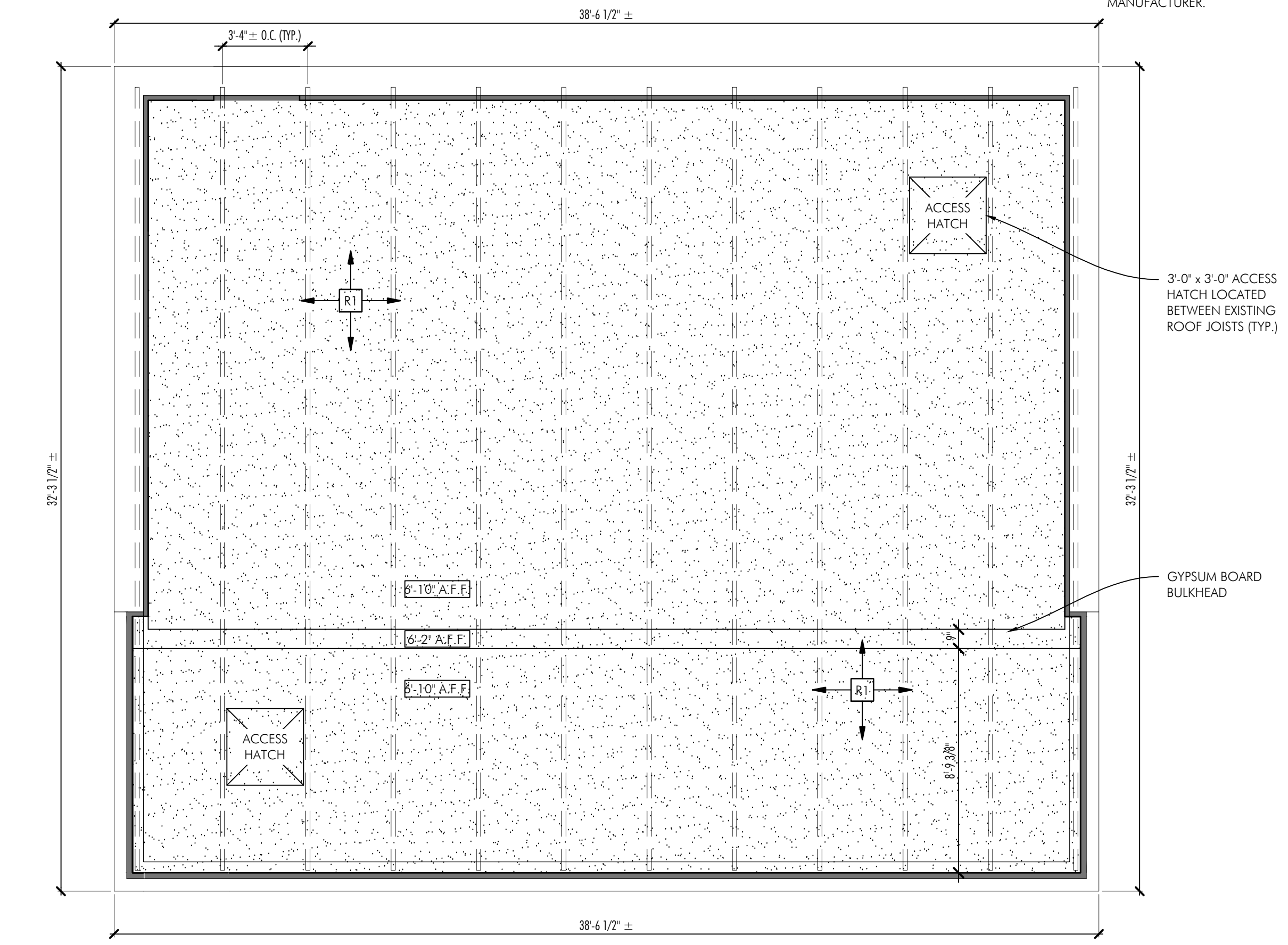
201A ENLARGE DETAIL @ OVERHEAD DOOR SILL
SCALE: 1" = 1'-0"



201B ENLARGE SECTION DETAIL
SCALE: 1" = 1'-0"



201C ENLARGE SECTION DETAIL
SCALE: 1" = 1'-0"



CEILING PLAN - PROPOSED
SCALE: 1/4" = 1'-0"

PARTITION AND ROOF LEGEND:			
TYPE		CONSTRUCTION	F.R.R.
P1		P1 CONSTRUCTION EXISTING EXTERIOR METAL CLADDING EXISTING WOOD STUDS EXISTING CONCRETE BLOCK 1-5/8" 18 GA. METAL STUD @ 16" O.C. 1 1/2" SPRAY APPLIED INSULATION 5/8" ABUSE RESISTANCE GYPSUM BOARD	-
P2		P2 CONSTRUCTION EXISTING EXTERIOR METAL CLADDING EXISTING WOOD CLADDING EXISTING WOOD STUDS 2"x4" WOOD STUD BETWEEN EXISTING FRAMING 1/2" PLYWOOD SHEATHING SPRAY APPLIED INSULATION 1-5/8" 18 GA. METAL STUD @ 16" O.C. 5/8" ABUSE RESISTANCE GYPSUM BOARD	-
R1		R1 CONSTRUCTION EXISTING ROOF TRUSS 1-5/8" METAL STUDS FRAMING AS REQUIRED TO SUPPORT NEW GYPSUM BOARD CEILING BLOWN-IN MINERAL FIBER INSULATION (R40) 5/8" ABUSE RESISTANCE GYPSUM BOARD	-

GENERAL NOTES:

- 1) ALL CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ONTARIO BUILDING CODE.
- 2) ALL WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DO NOT SCALE DRAWINGS. ALL DIMENSIONS TO BE VERIFIED BY CONTRACTOR BEFORE COMMENCING ANY WORK.
- 3) BEFORE BEGINNING WORK AT THE SITE AND THROUGHOUT THE COURSE OF THE WORK, INSPECT AND VERIFY THE LOCATION AND CONDITION OF EVERY ITEM AFFECTED BY THE WORK UNDER THIS CONTRACT AND REPORT DISCREPANCIES TO THE CONSULTANT BEFORE PROCEEDING.
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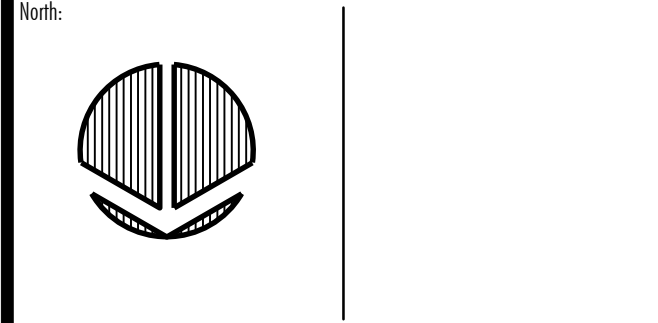
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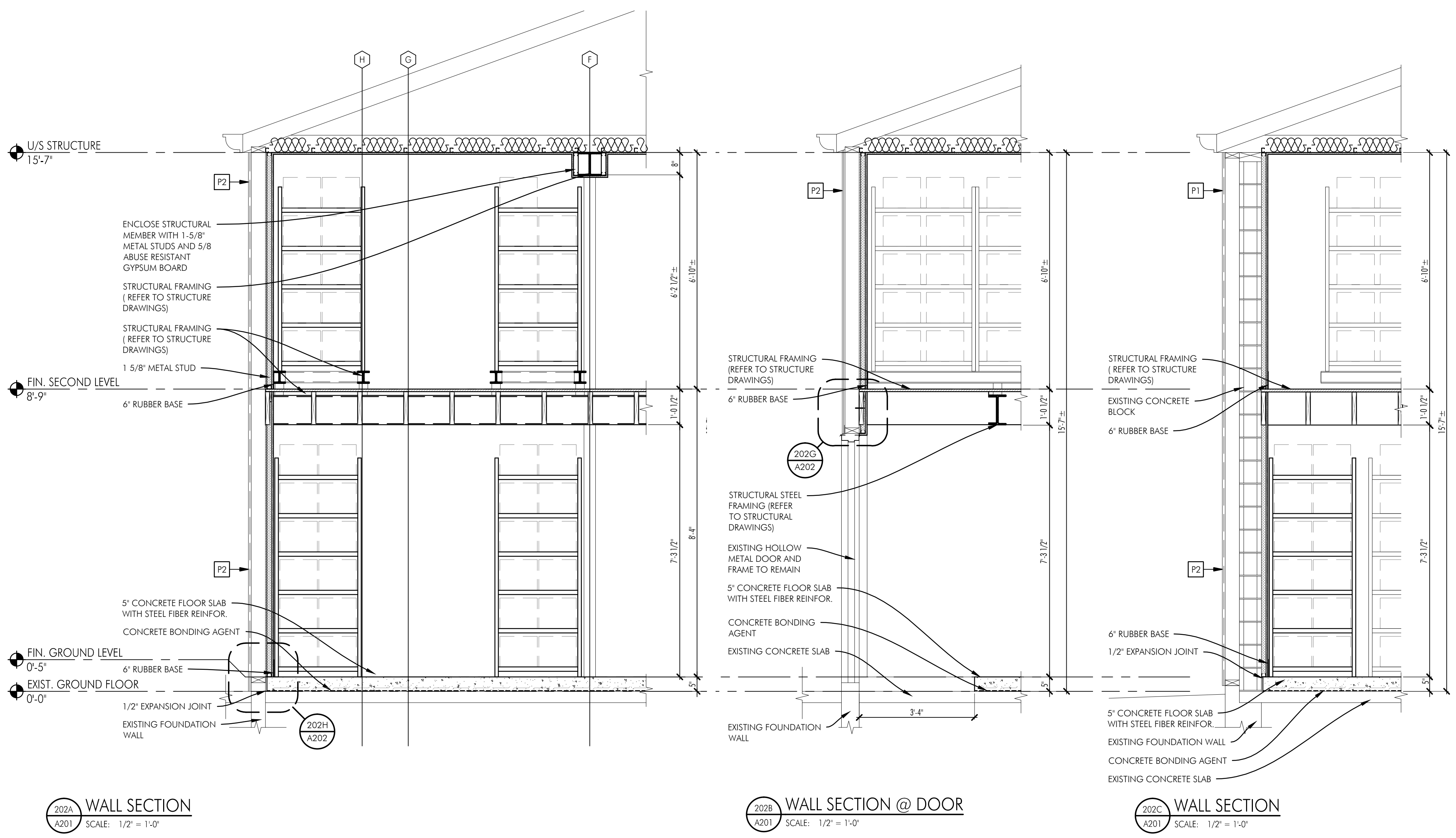
Project Name: **BUILDING #73 RENOVATIONS**

Client: **AGRICULTURE AND AGRI-FOOD CANADA**

Project Title: **PROPOSED FIRST FLOOR, SECOND FLOOR AND CEILING PLANS**

Design By: RG
Drawn By: AK
Checked By: RG
Project No. 15084
Sheet No. A201

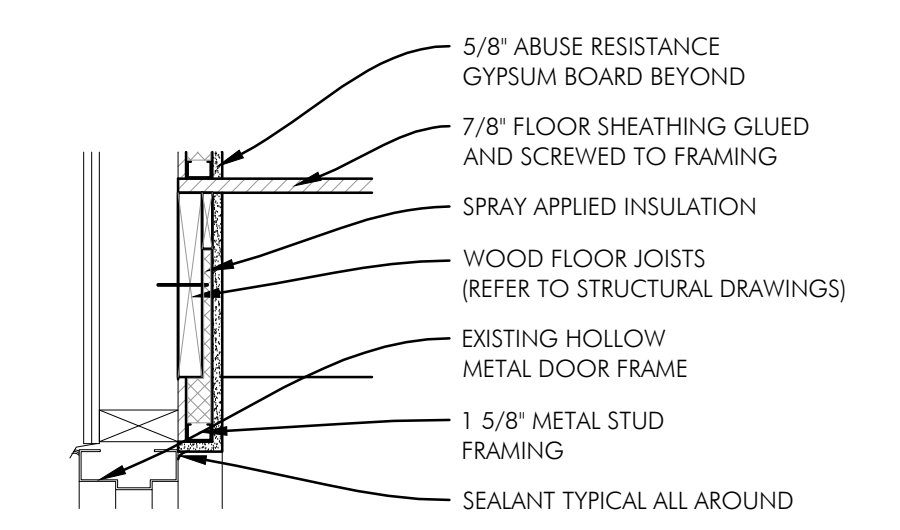
15084 A201



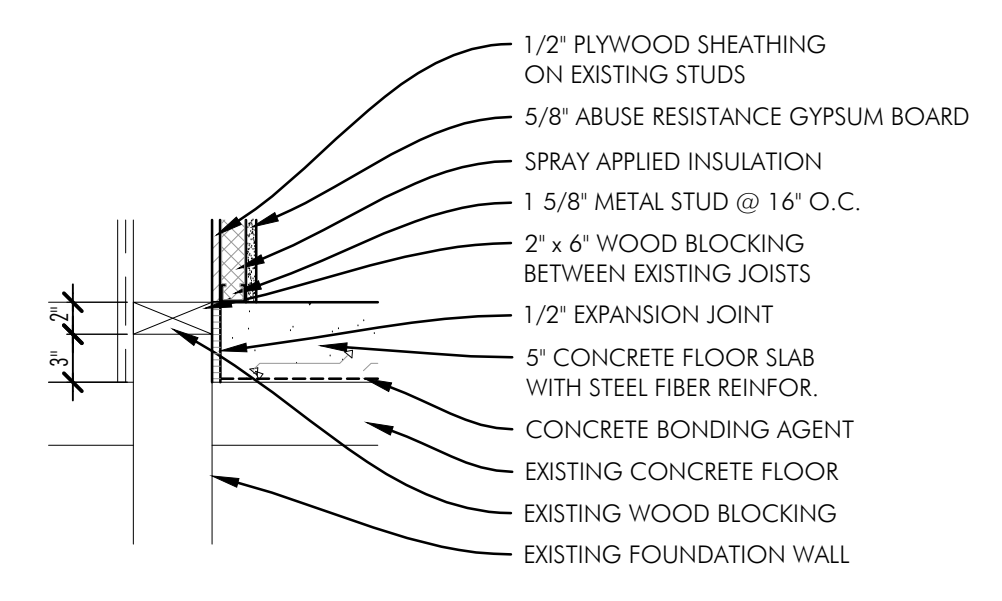
202A WALL SECTION
SCALE: 1/2" = 1'-0"

202B WALL SECTION @ DOOR
SCALE: 1/2" = 1'-0"

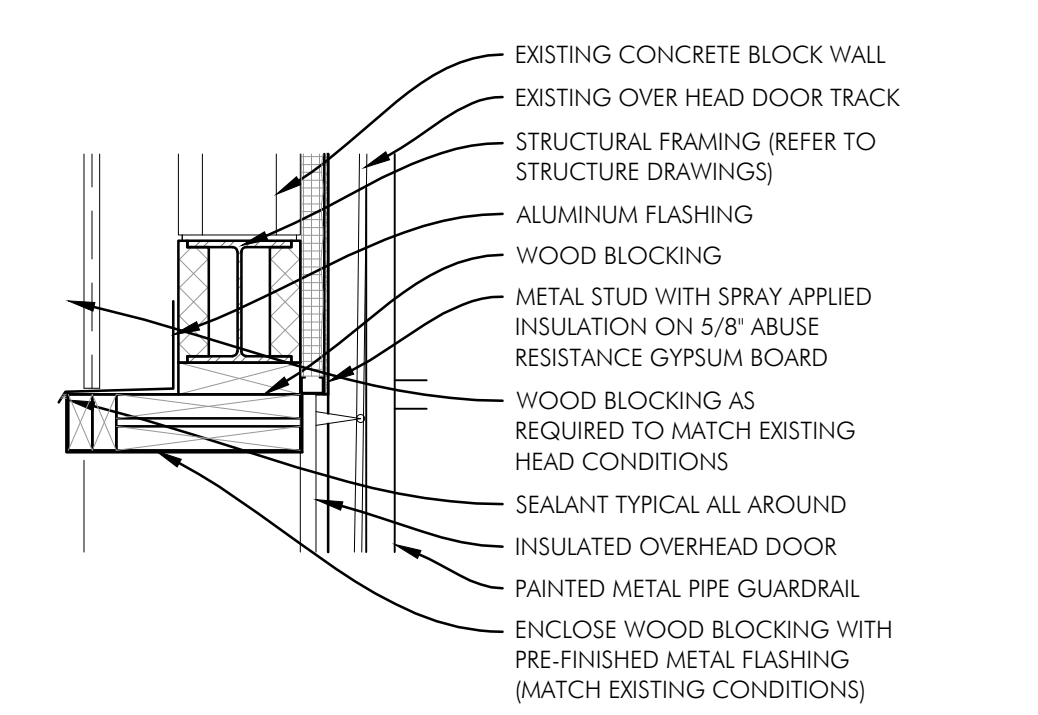
202C WALL SECTION
SCALE: 1/2" = 1'-0"



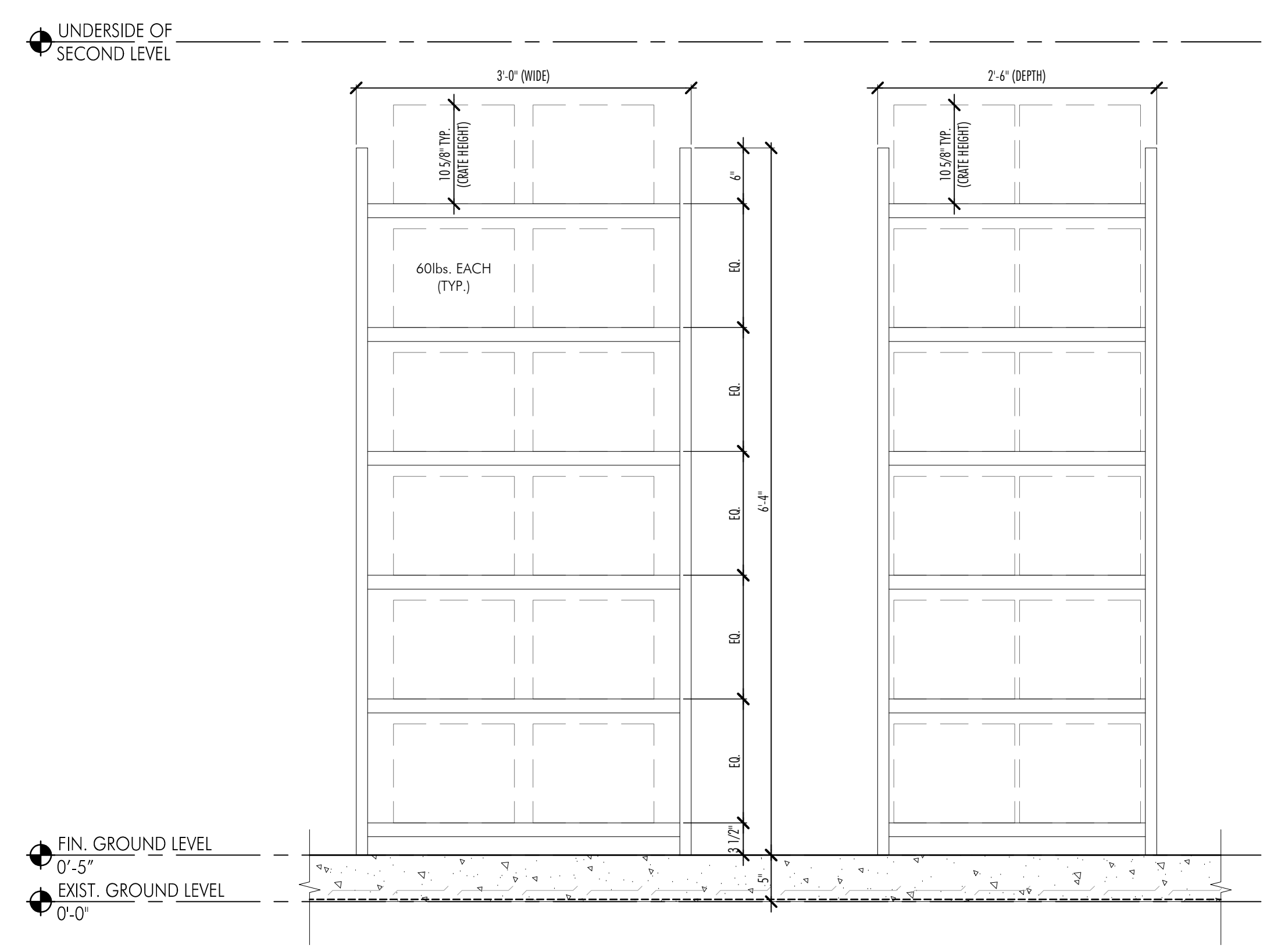
202G TYPICAL DOOR HEAD DETAIL
SCALE: 1" = 1'-0"



202H ENLARGE DETAIL @ FLOOR SLAB TYPICAL
SCALE: 1" = 1'-0"

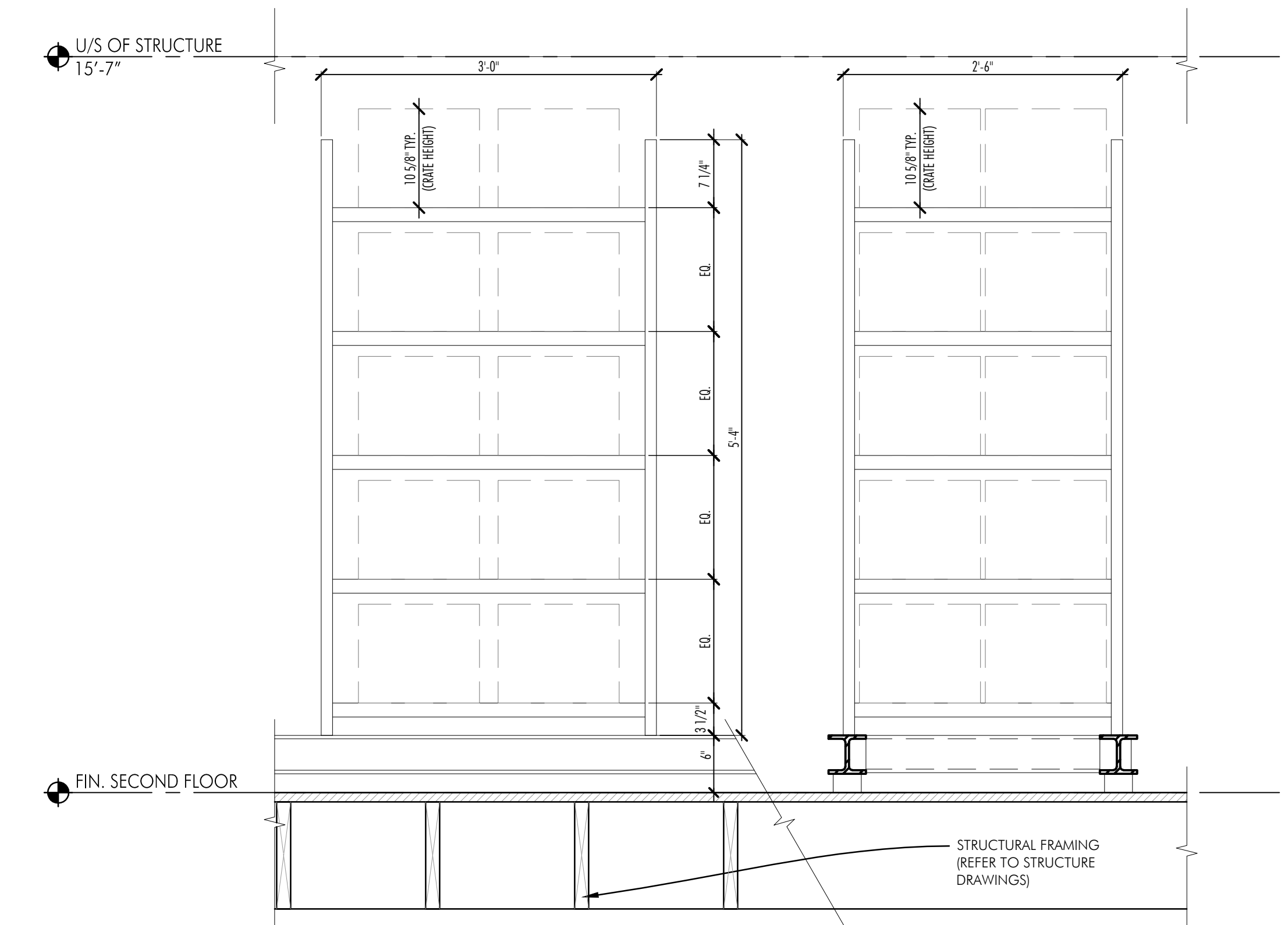


202I ENLARGE DETAIL @ OVERHEAD DOOR HEAD
SCALE: 1" = 1'-0"



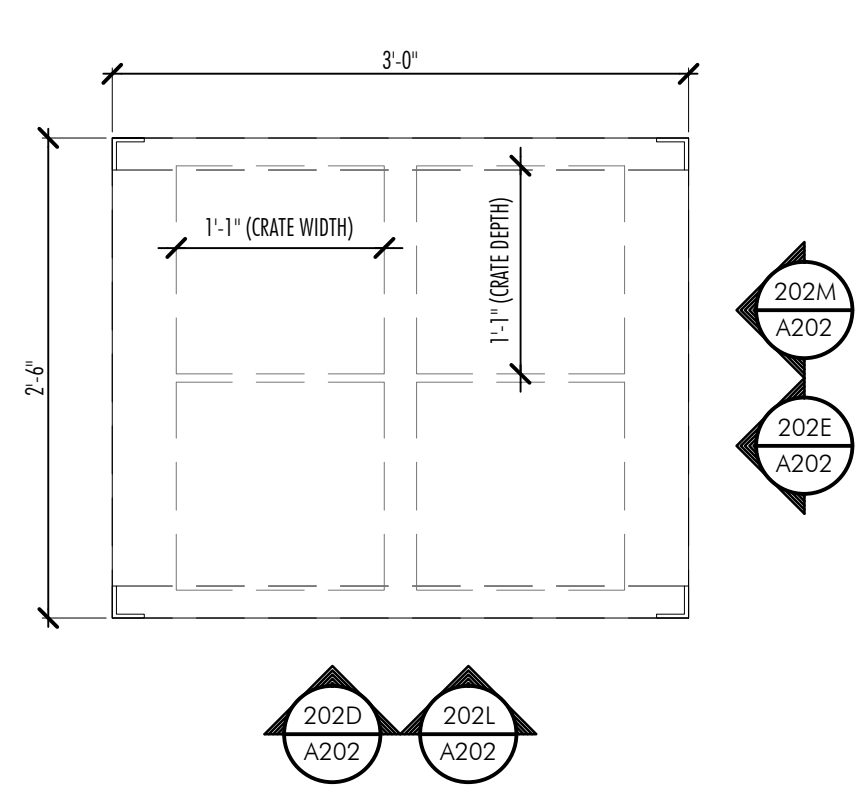
202D METAL SHELVES @ FIRST LEVEL
SCALE: 1" = 1'-0"

202E METAL SHELVES @ FIRST LEVEL
SCALE: 1" = 1'-0"



202L METAL SHELVES @ SECOND LEVEL
SCALE: 1" = 1'-0"

202M METAL SHELVES @ SECOND LEVEL
SCALE: 1" = 1'-0"



202F ENLARGE METAL SHELVES
SCALE: 1" = 1'-0"

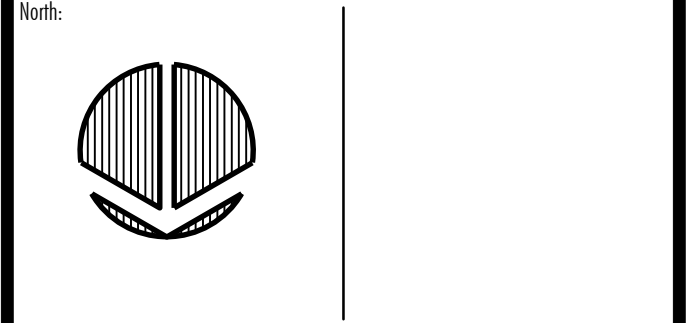
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Consultant:

Project Name: **BUILDING #73 RENOVATIONS**
2585 COUNTY ROAD 20
HARROW, ONTARIO

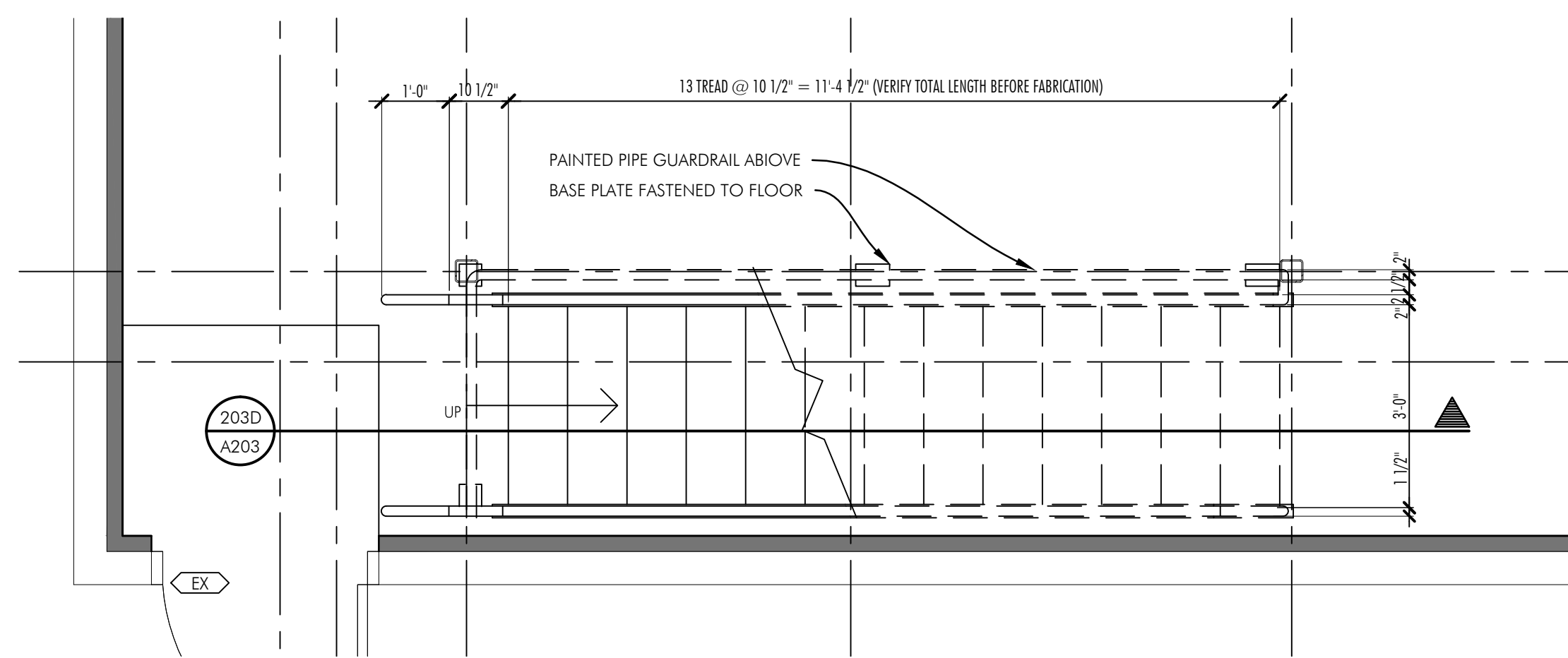
Client: **AGRICULTURE AND AGRI-FOOD CANADA**
HARROW, ONTARIO

Sheet Title: **WALL SECTIONS AND DETAILS ENLARGE METAL RACK PLAN AND ELEVATIONS**

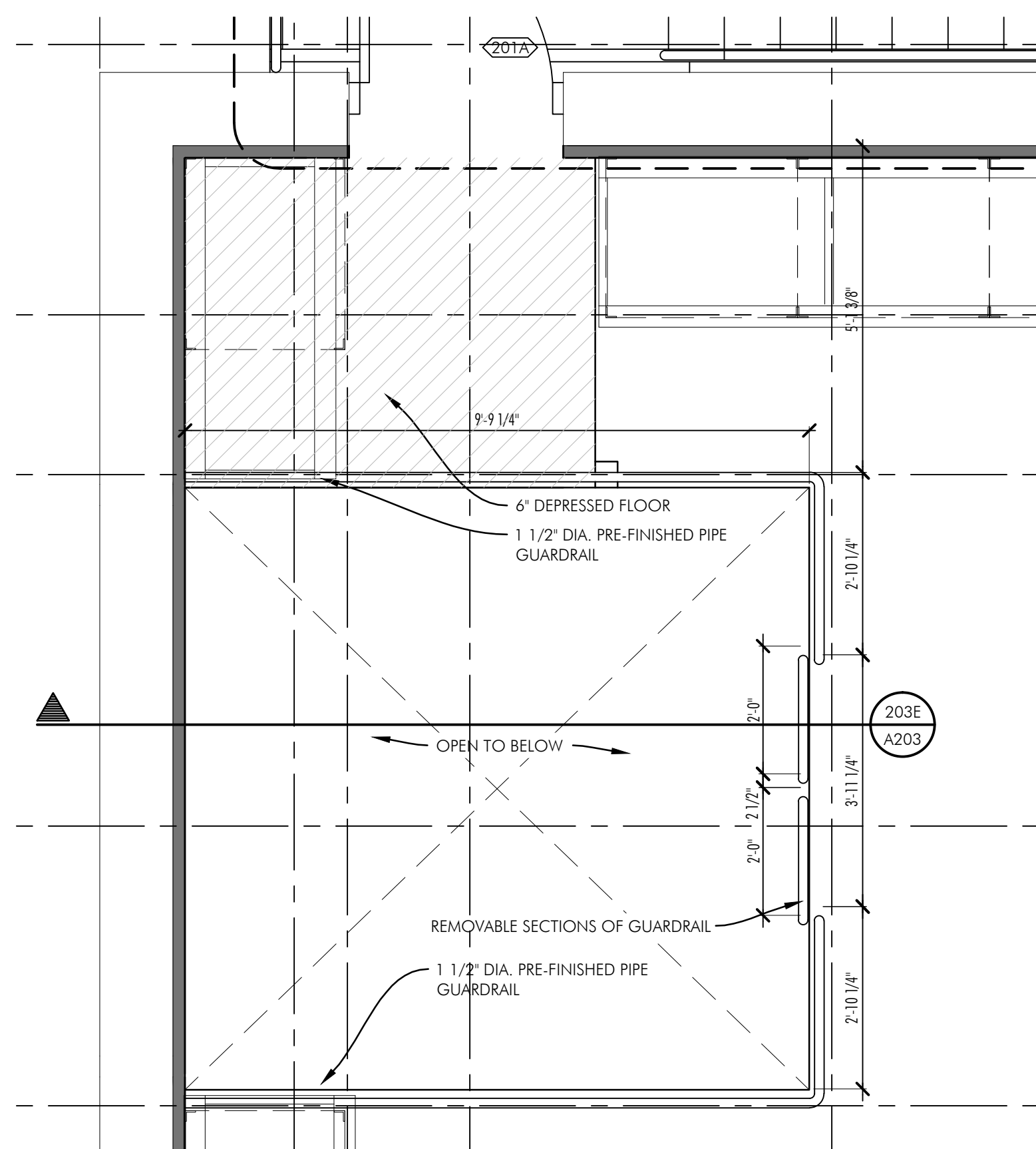
Design By: RG
Drawn By: AK
Checked By: RG

Project No: **15084** Sheet No: **A202**

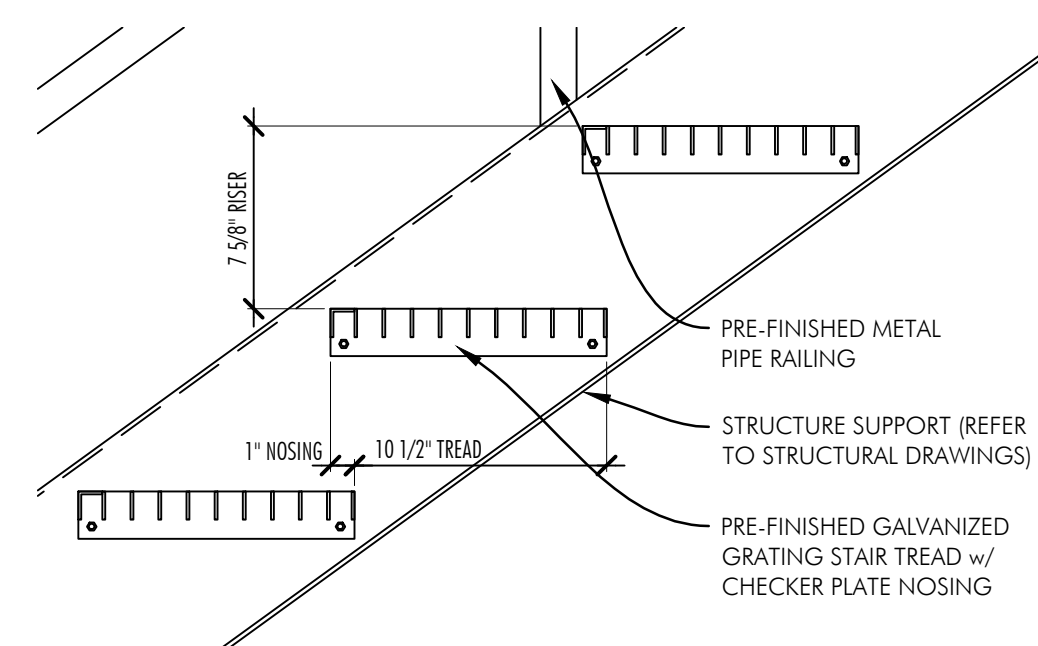
12/27/2015 9:37 AM



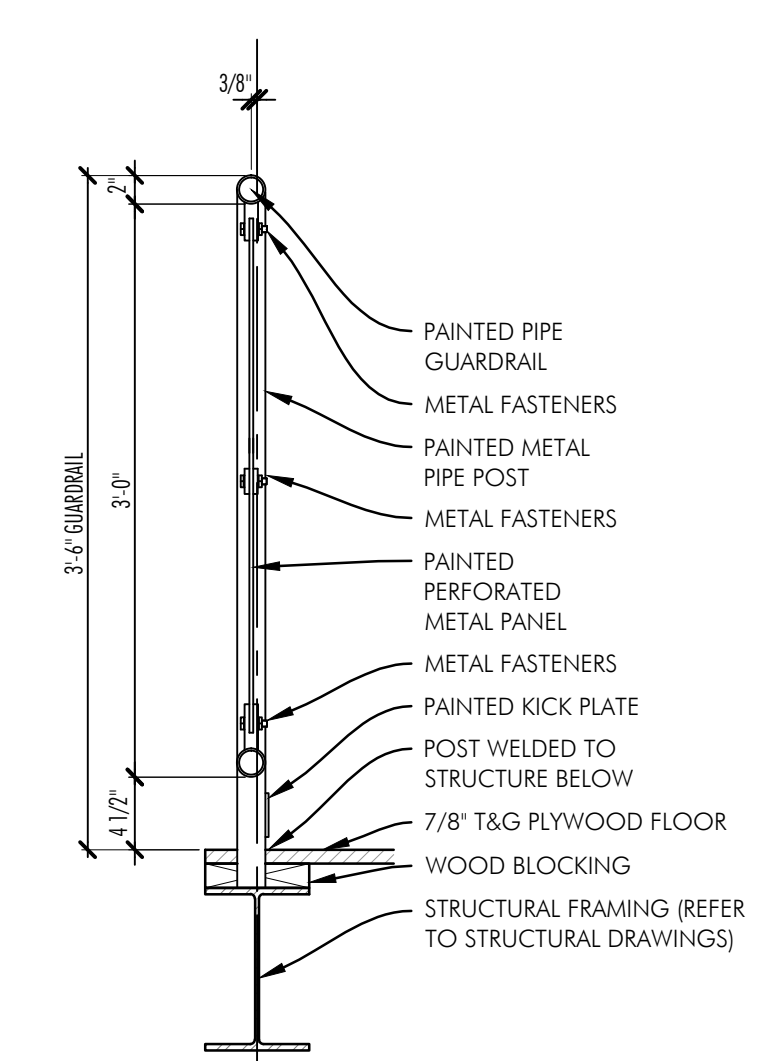
203A
A201 TYP. ENLARGE STAIR PLAN - GROUND FLOOR
SCALE: 1/2" = 1'-0"



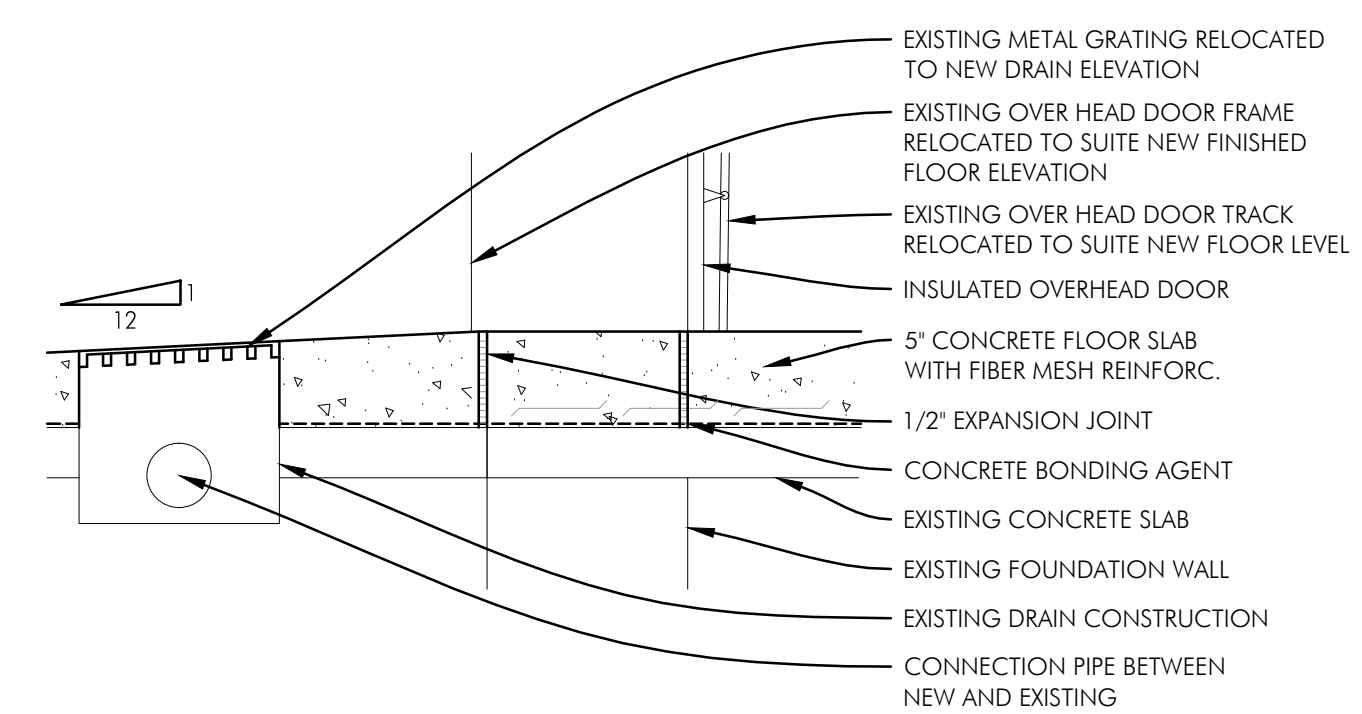
203B
A201 ENLARGE GUARDRAIL PLAN @ FLOOR OPENING
SCALE: 1/2" = 1'-0"



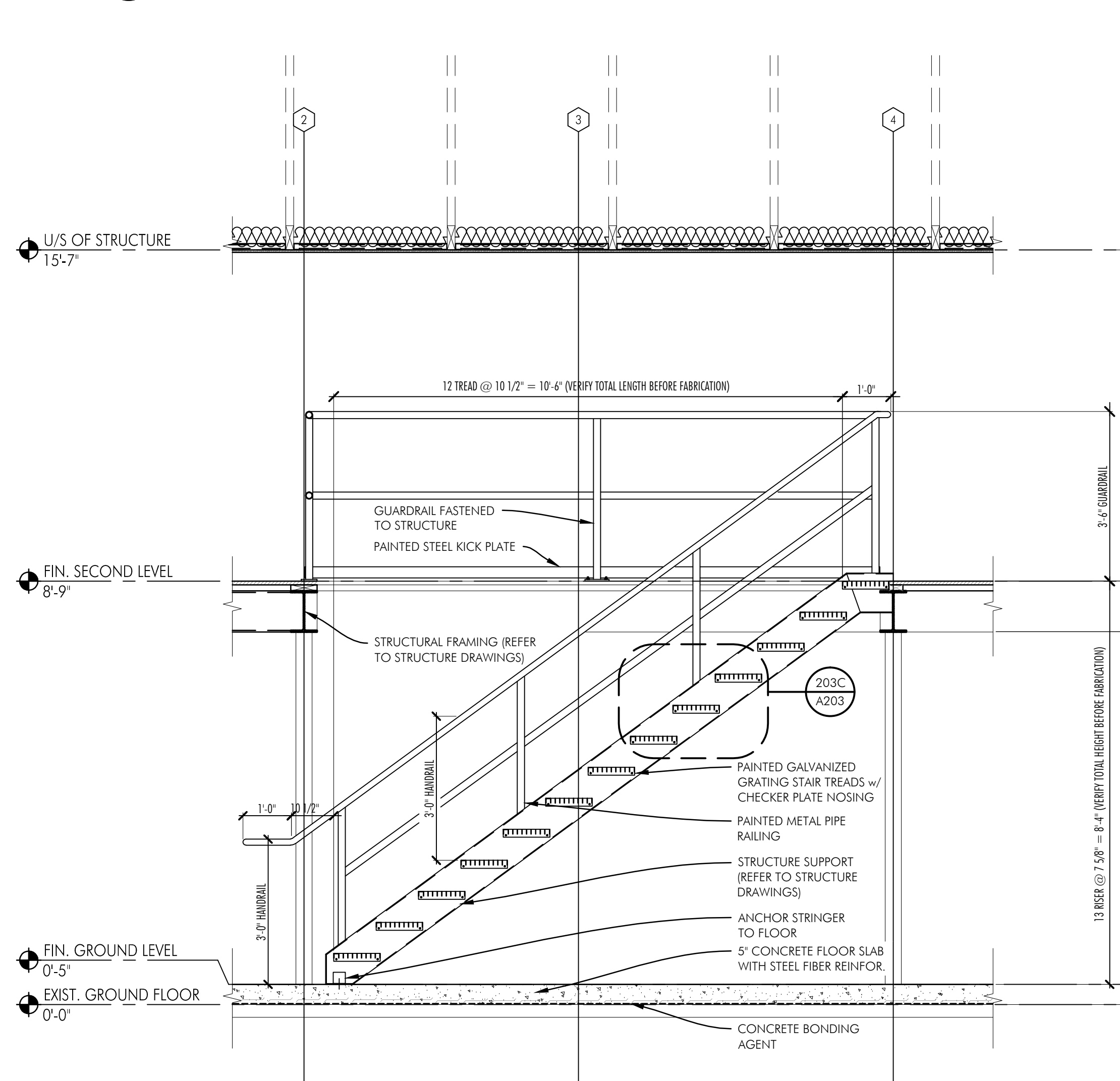
203C
A203 ENLARGE STAIR SECTION DETAIL
SCALE: 1" = 1'-0"



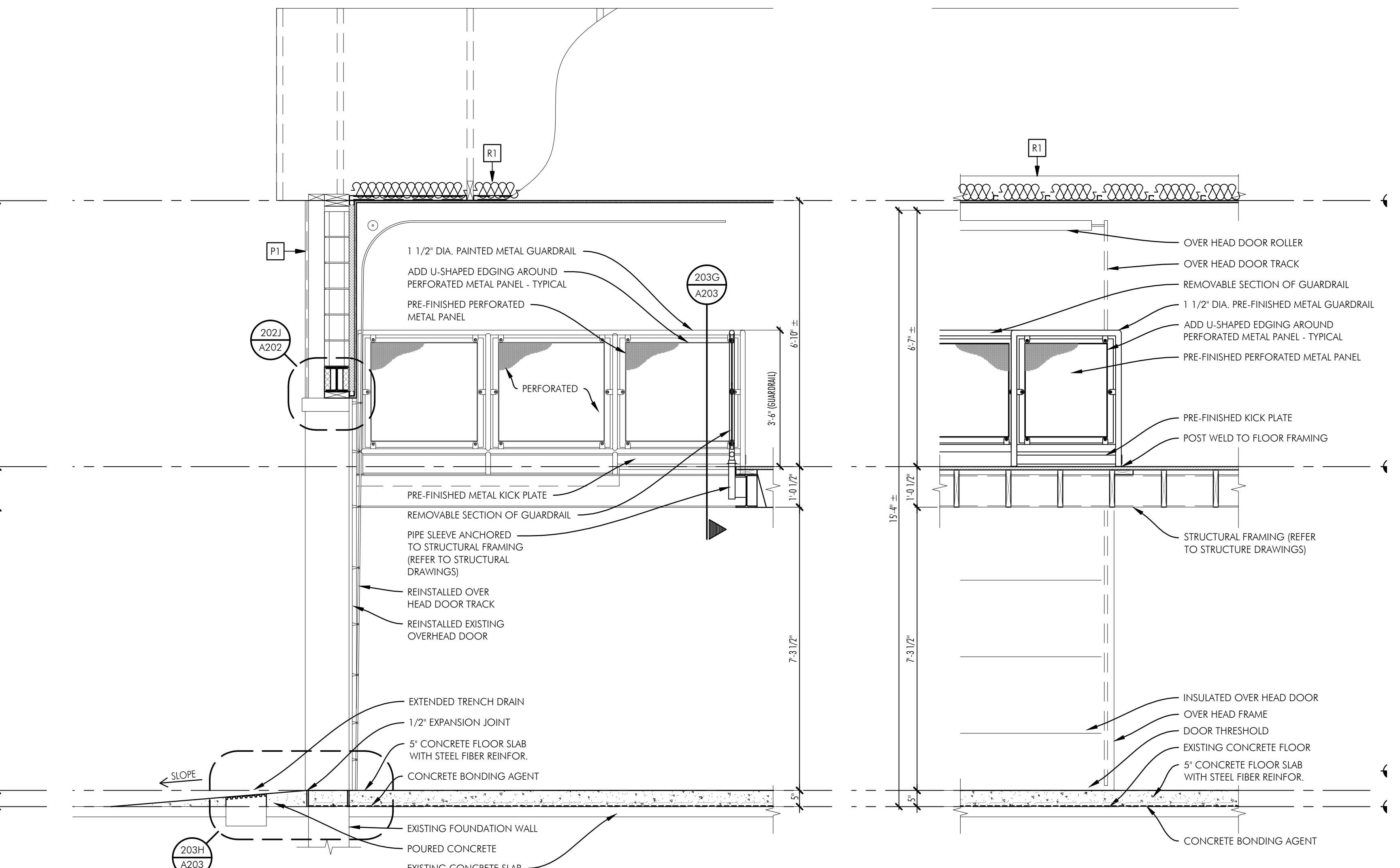
203G
A203 ENLARGE RAILING SECTION
SCALE: 1" = 1'-0"



202H
A203 ENLARGED DETAIL @ OVERHEAD DOOR SILL
SCALE: 1" = 1'-0"



203D
A203 TYPICAL STAIR SECTION
SCALE: 1/2" = 1'-0"



203E
A203 GUARDRAIL ELEVATION @ FLOOR OPENING
SCALE: 1/2" = 1'-0"

203F
A203 SLIDING DOOR ELEVATION @ FLOOR OPENING
SCALE: 1/2" = 1'-0"

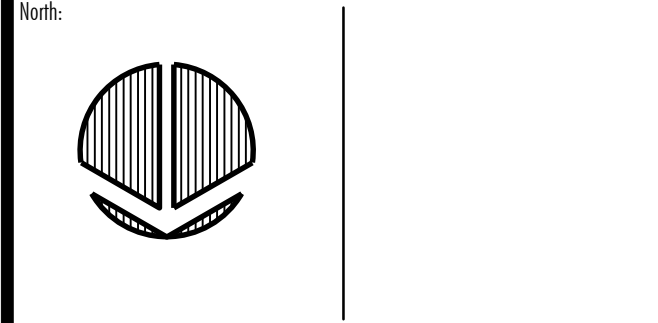
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Project Name: **BUILDING #73 RENOVATIONS**
2585 COUNTY ROAD 20
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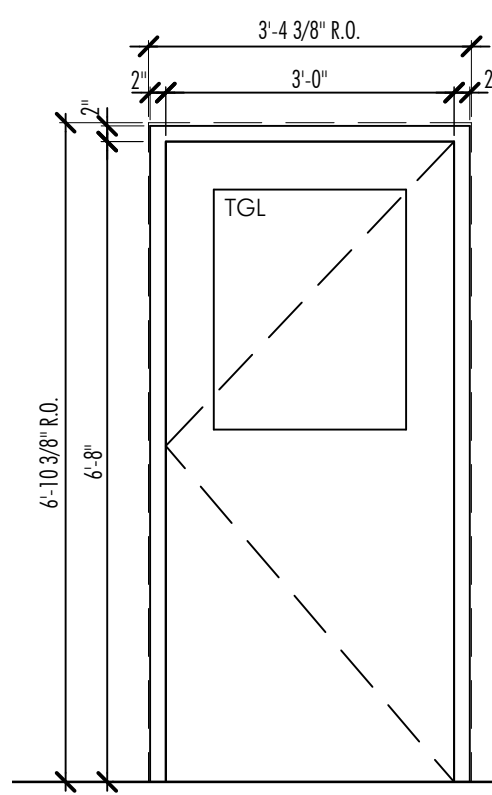
Client: **AGRICULTURE AND AGRI-FOOD CANADA**
HARROW, ONTARIO

Sheet Title: **ENLARGED SOUTH INTERIOR STAIR PLANS, SECTIONS AND DETAILS GUARDRAIL @ FLOOR OPENING**

Design By: RG
Drawn By: AK
Checked By: RG
Project No. 15084
Sheet No. A203

15084 A203

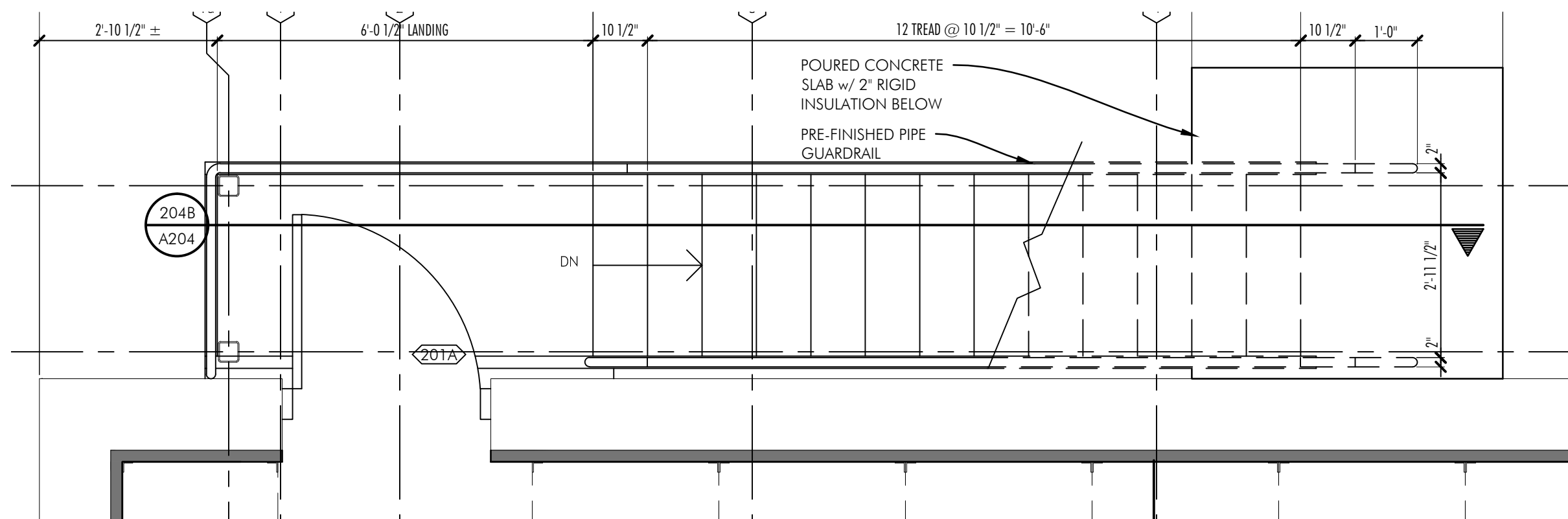
12/27/2015 5:38 AM



DOOR AND FRAME SCHEDULE														
MARK	DOOR STATISTICS		FRAME		PANEL		F.R.R.	KICK PLATE	DOOR CLOSER	HANDLE	GLAZING	LATCH SET	COMMENT	
	PANELS	HEIGHT	WIDTH	MATERIAL	FINISH	MATERIAL								FINISH
201A	1	6'-8"	3'-0"	INSULATED METAL	PAINT	HOLLOW METAL	PAINT	-	INTERIOR	YES	YES	YES	NOTE	SEE GENERAL NOTES

- GENERAL NOTES:
1. DOOR TO RECEIVE CLASSROOM TYPE FUNCTIONING HARDWARE.
 2. DOOR TO RECEIVE WEATHER SEAL AND DOOR SWEEP.
 3. DOOR TO RECEIVE PANIC HARDWARE ON THE INTERIOR SIDE.
 4. DOOR FRAME AND PANEL PAINT COLOUR TO BE DETERMINED BY CONSULTANT.
 5. ALL GLAZING WITHIN DOOR PANELS TO HAVE WIRE MESH SAFETY GLAZING

DOOR ELEVATION
SCALE: 1/2" = 1'-0"



204A
A204 ENLARGE EXTERIOR EXIT STAIR PLAN
SCALE: 1/2" = 1'-0"

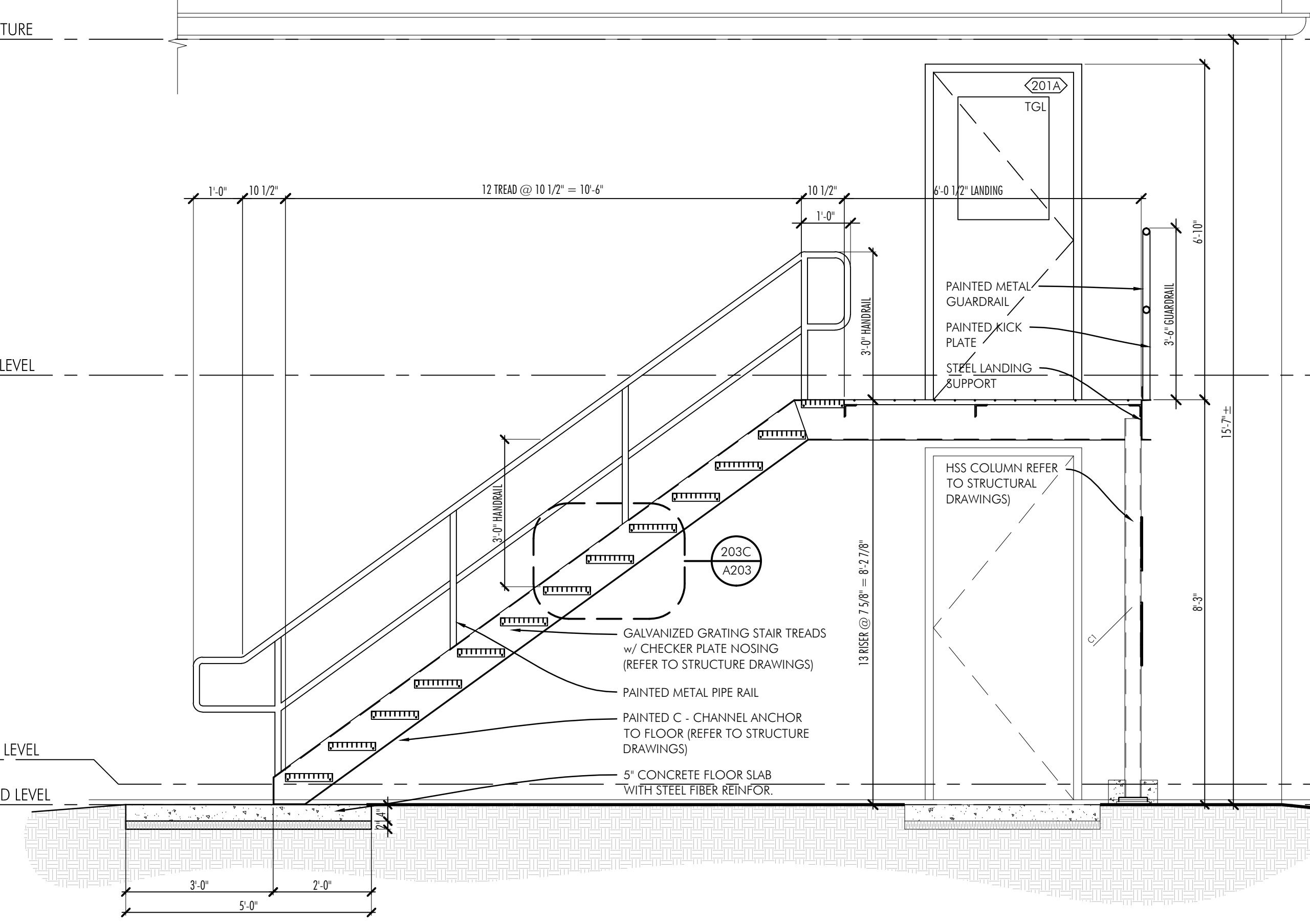
U/S OF STRUCTURE
15'-7"

FIN. SECOND LEVEL
8'-9"

FIN. GROUND LEVEL
0'-5"

EXIST. GROUND LEVEL
0'-0"

204B
A204 SECTION @ EXTERIOR EXIT STAIR
SCALE: 1/2" = 1'-0"



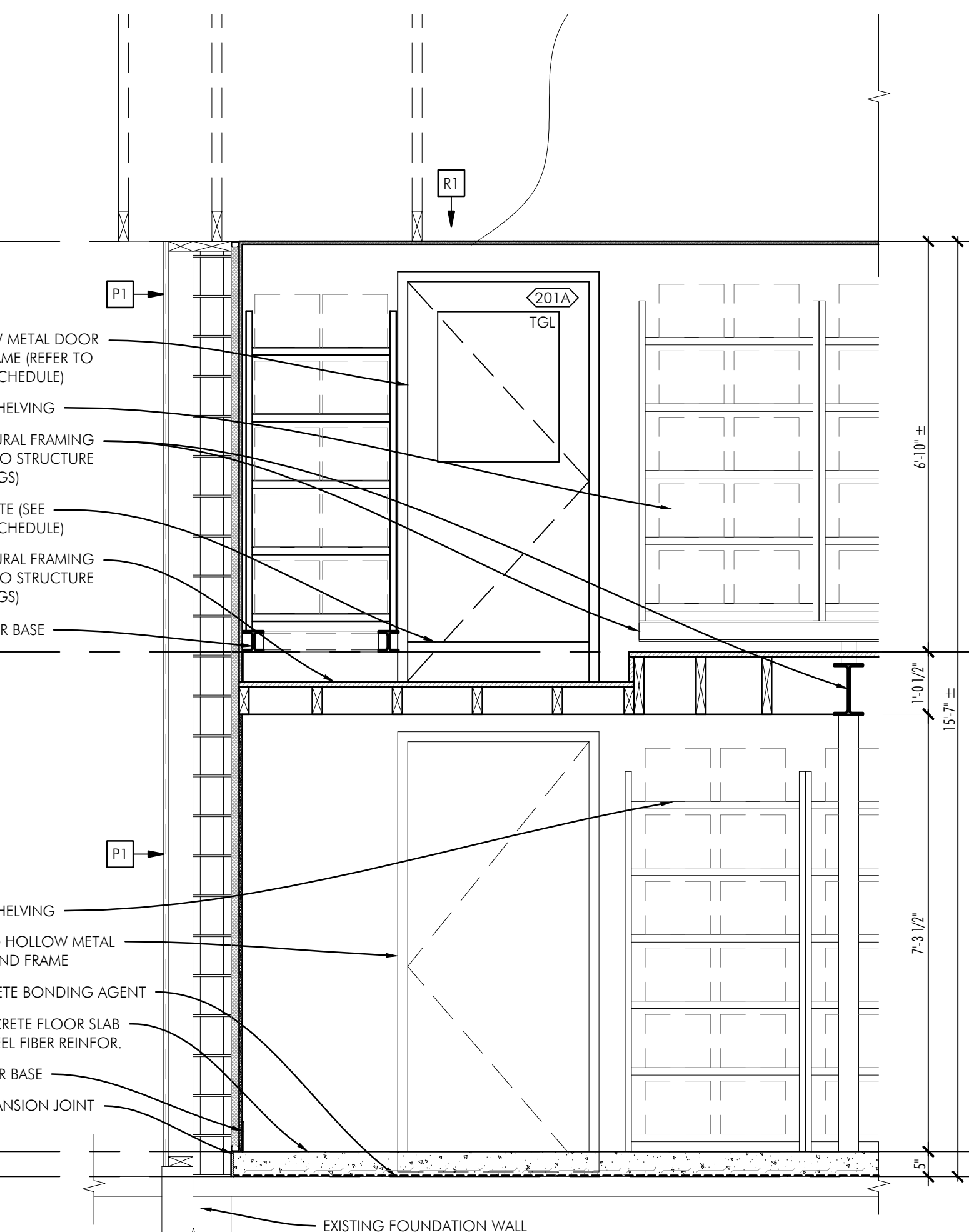
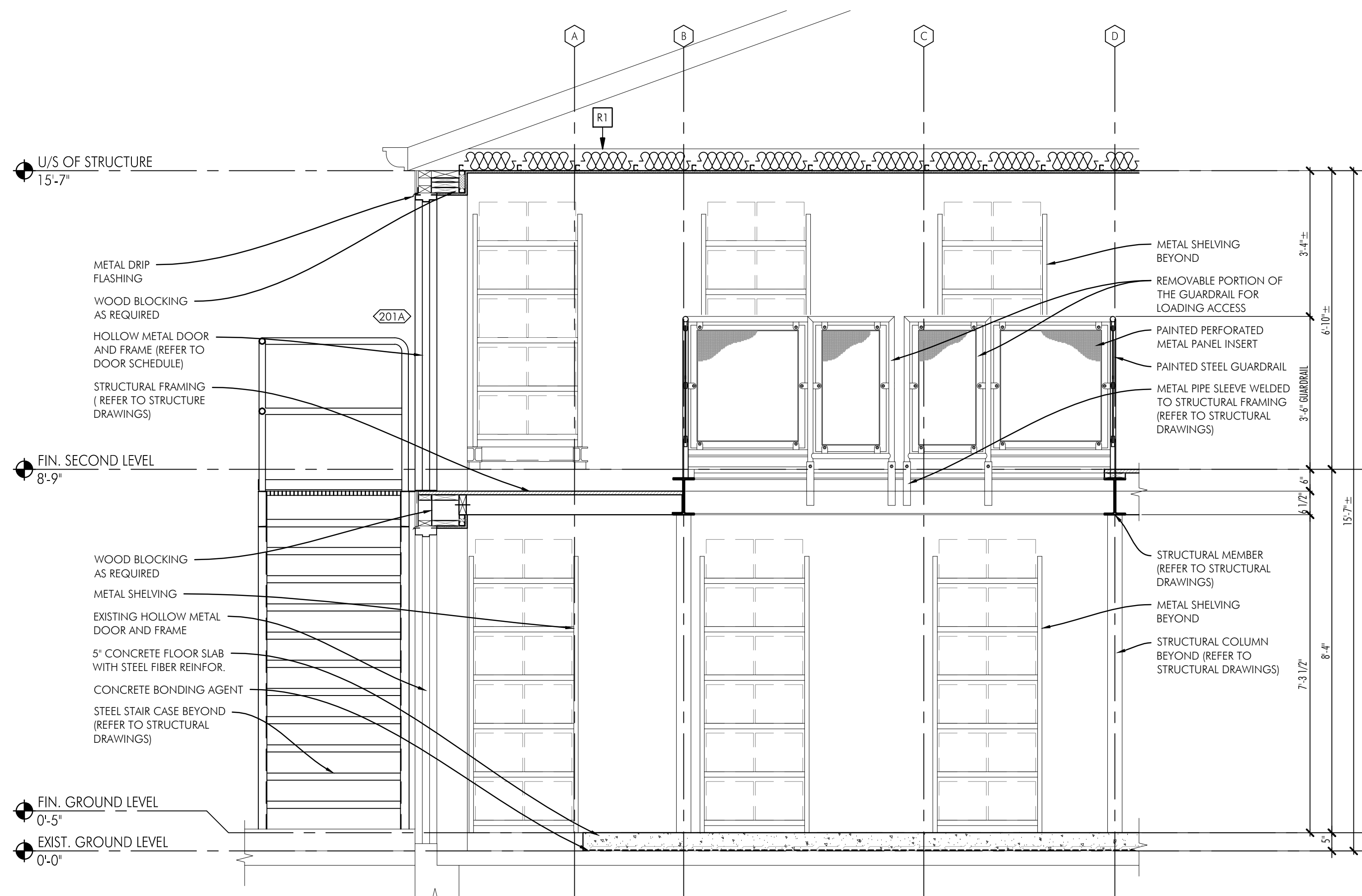
U/S OF STRUCTURE
15'-7"

FIN. SECOND LEVEL
8'-9"

FIN. GROUND LEVEL
0'-5"

EXIST. GROUND LEVEL
0'-0"

204C
A201 WALL SECTION
SCALE: 1/2" = 1'-0"



204D
A201 SECTION @ DEPRESSION IN FLOOR
SCALE: 1/2" = 1'-0"

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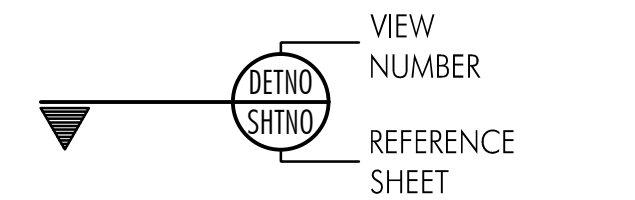
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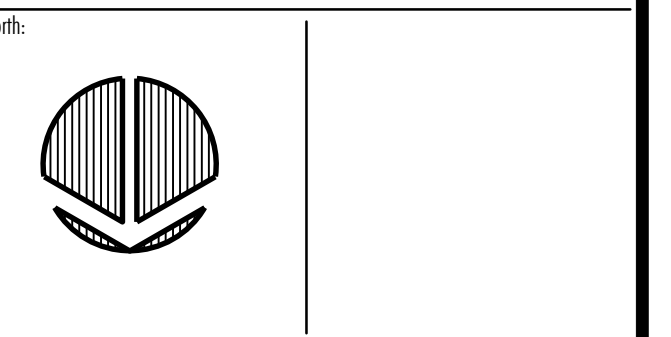


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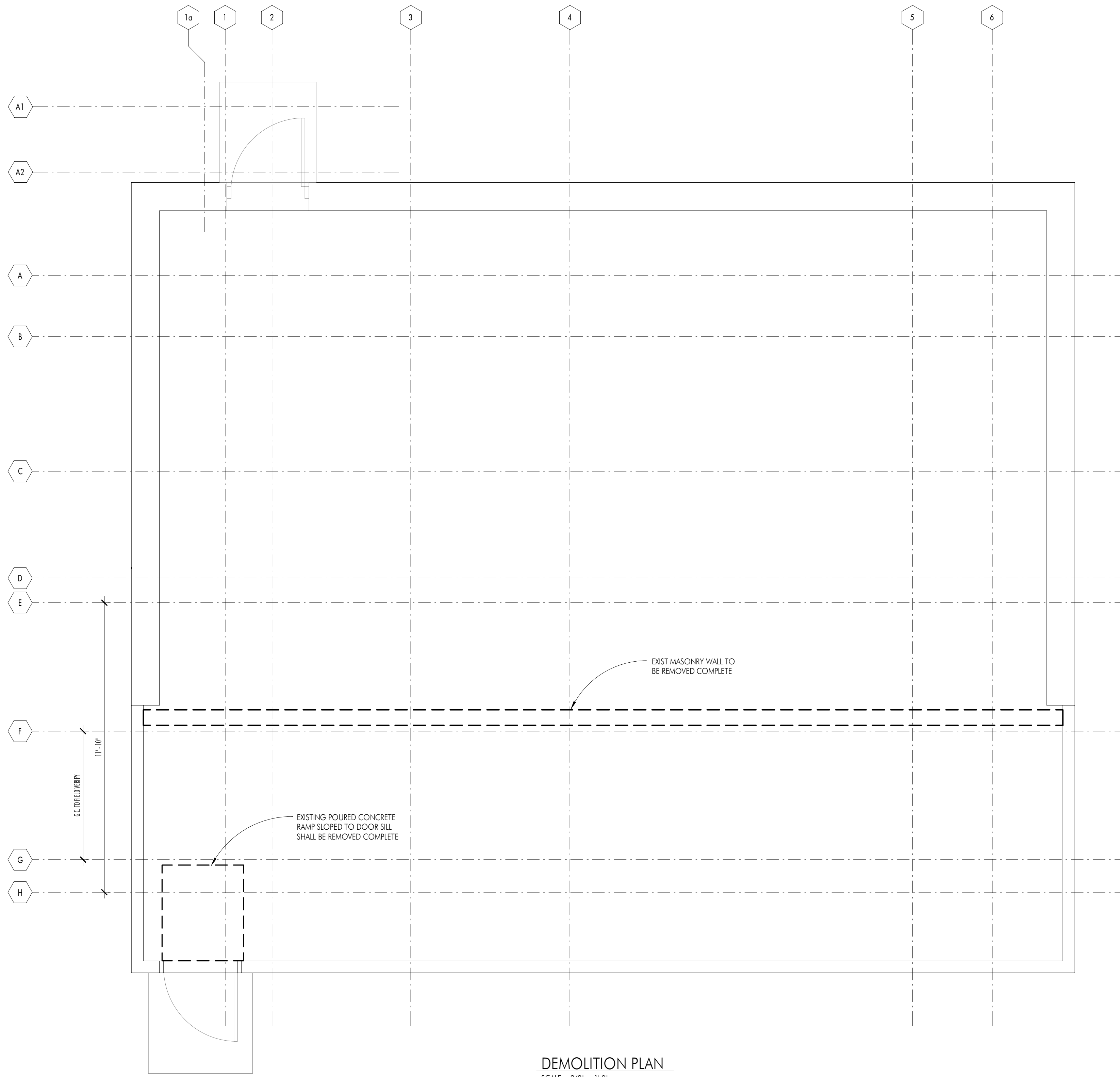
Project Name: **BUILDING #73 RENOVATIONS**
2585 COUNTY ROAD 20
HARROW, ONTARIO

Client: **AGRICULTURE AND AGRI-FOOD CANADA**
HARROW, ONTARIO

Sheet Title: **ENLARGED EXTERIOR EXIT STAIR PLANS, SECTIONS AND DETAILS**

Design By: RG
Drawn By: AK
Checked By: RG
Project No. 15084

Sheet No. **A204**



DEMOLITION NOTES:

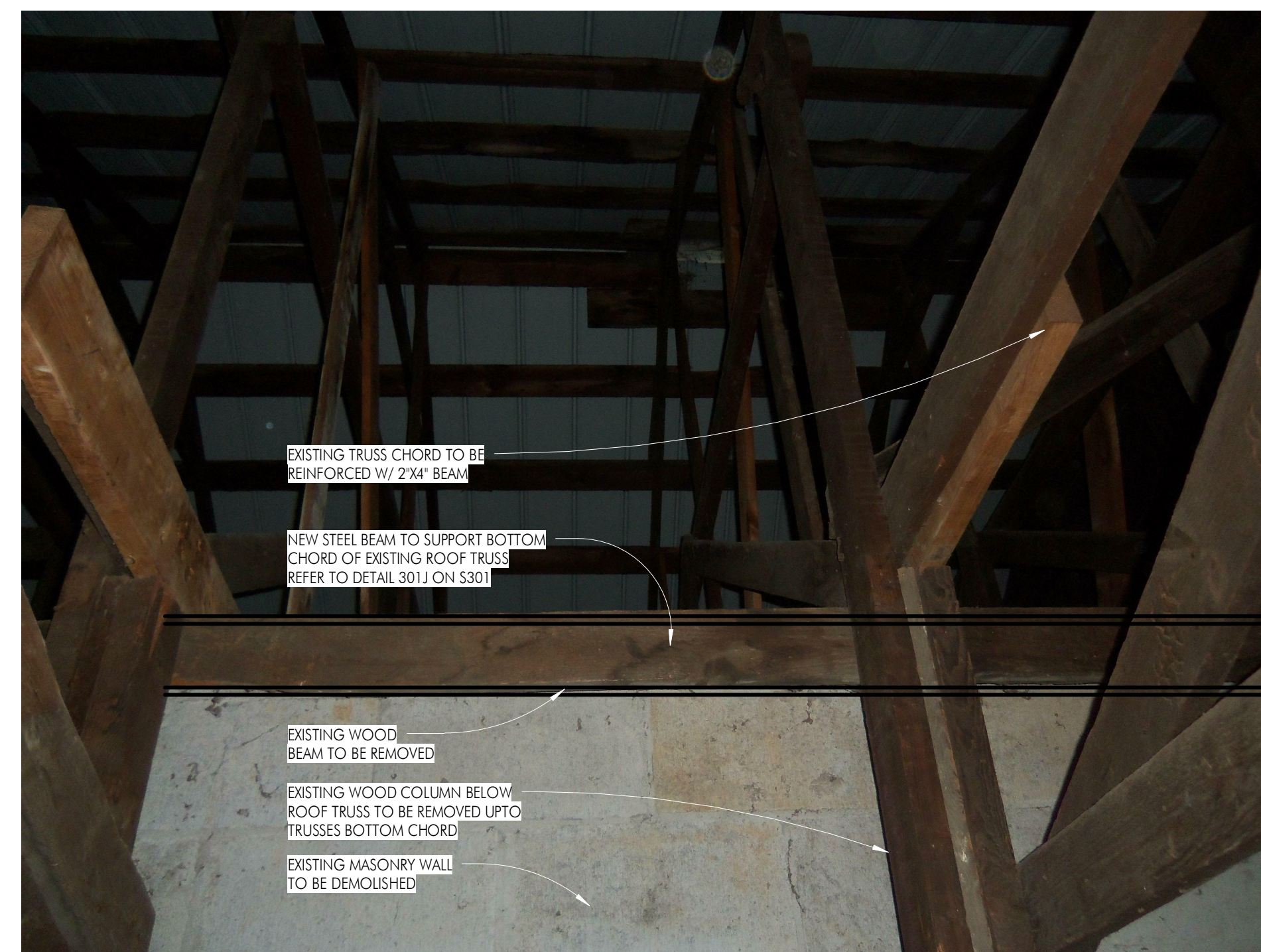
- REFER TO STRUCTURAL DRAWINGS FOR OVERALL DEMOLITION PROCEDURES.
- REFER TO C100 FOR DESIGN LOADS AND CONCRETE NOTES.
- COORDINATE ALL DIMENSIONS AND OPENINGS WITH ARCHITECTURAL DRAWINGS.

NOTE:

- EXISTING INTERIOR MASONRY WALL SUPPORTS EXISTING ROOF TRUSSES - REFER TO DETAIL 301J ON S301 AND ATTACHED PHOTOS. NEW STEEL COLUMNS AND BEAMS ON COLUMN LINE H ARE TO BE INSTALLED PRIOR TO DEMOLITION OF EXISTING MASONRY WALL. GENERAL CONTRACTOR TO SUBMIT INSTALLATION PROCEDURE TO CONSULTANT FOR REVIEW PRIOR TO COMMENCING FIELD WORK.



EXIST WOOD TRUSS BOTTOM CHORD
SCALE: N.T.S.



TOP OF EXIST MASONRY WALL
SCALE: N.T.S.

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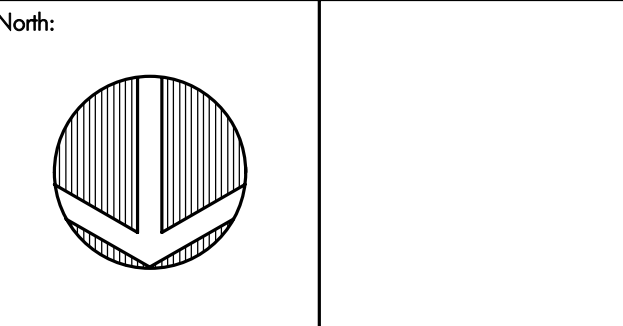
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No.	Issued for:	Date:	By:
2	TENDER	2015 12 02	MV
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3535 North Service Road East
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Fax: (519) 966-6753
www.glossassociates.com



Consultant:

Project Name:

BUILDING #73 RENOVATION

2585 COUNTY ROAD 20
HARROW, ONTARIO

Client:

AGRICULTURE AND AGRI-FOOD CANADA

HARROW, ONTARIO

Sheet Title:

DEMOLITION PLANS

Design By: MV
Drawn By: CM
Checked By: MV

Project No: 15084 | Sheet No: C101

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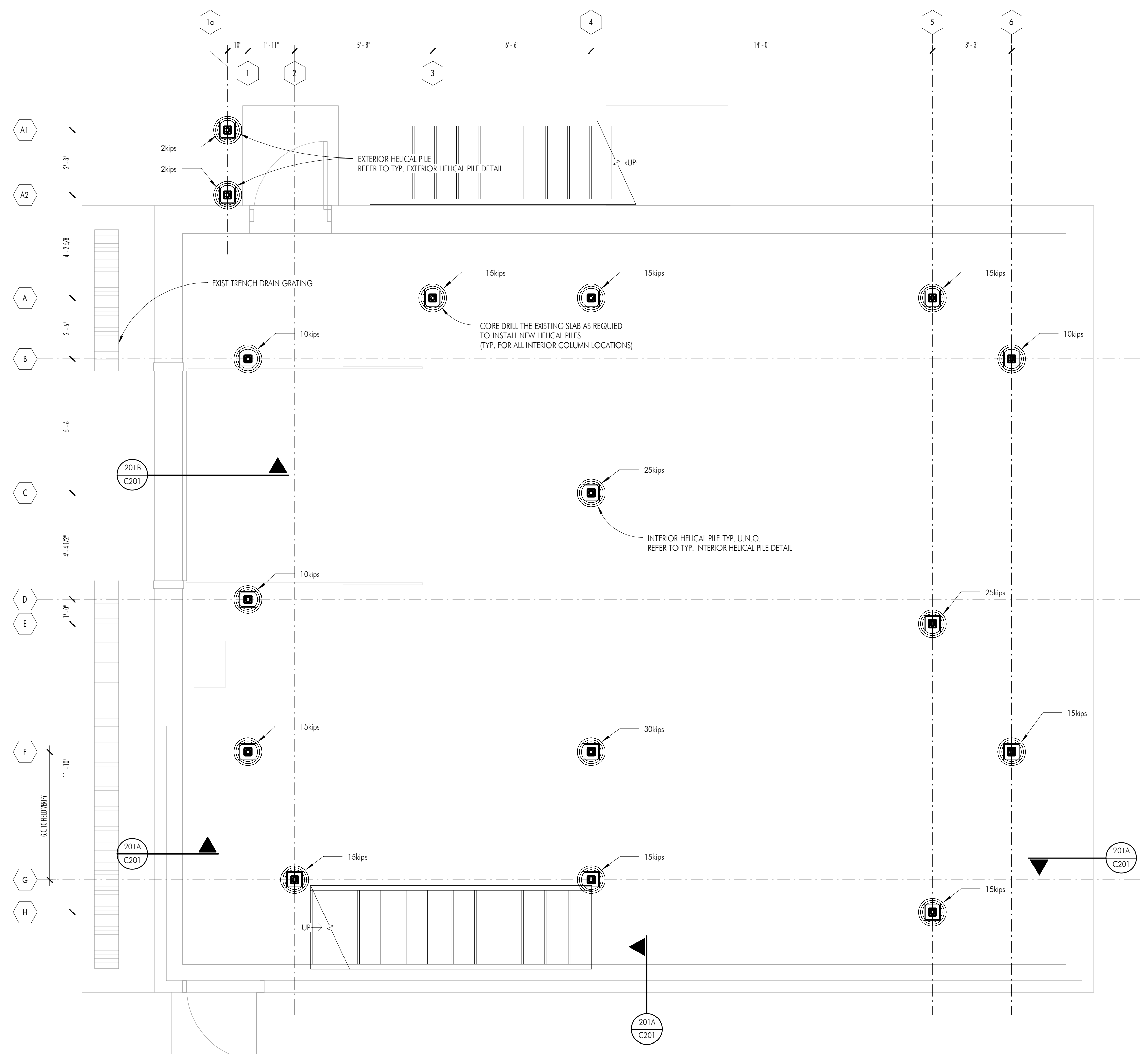
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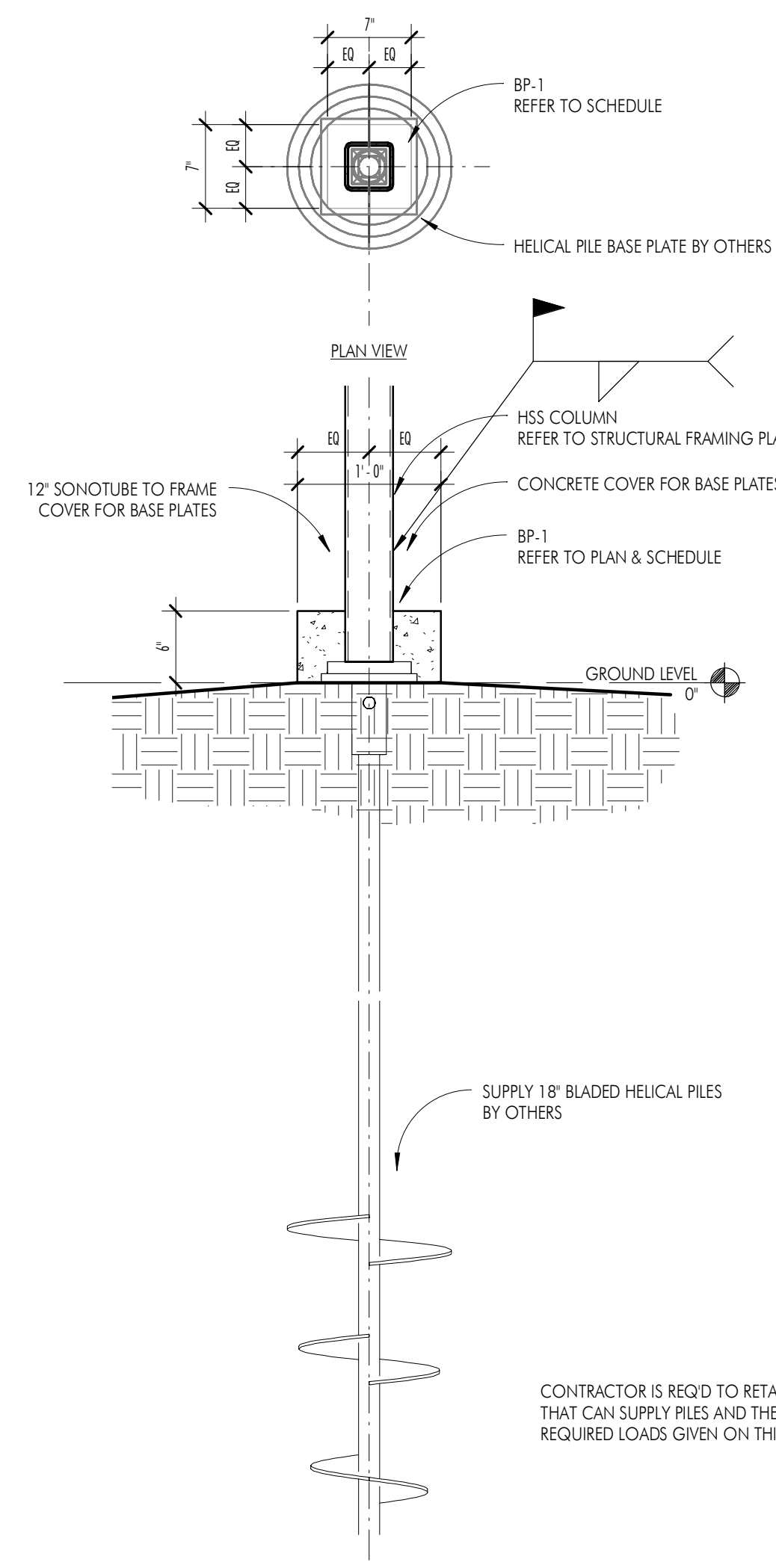
The contractor working from drawings of specific details must assume full responsibility and be liable for any corrections or damages resulting from their work.

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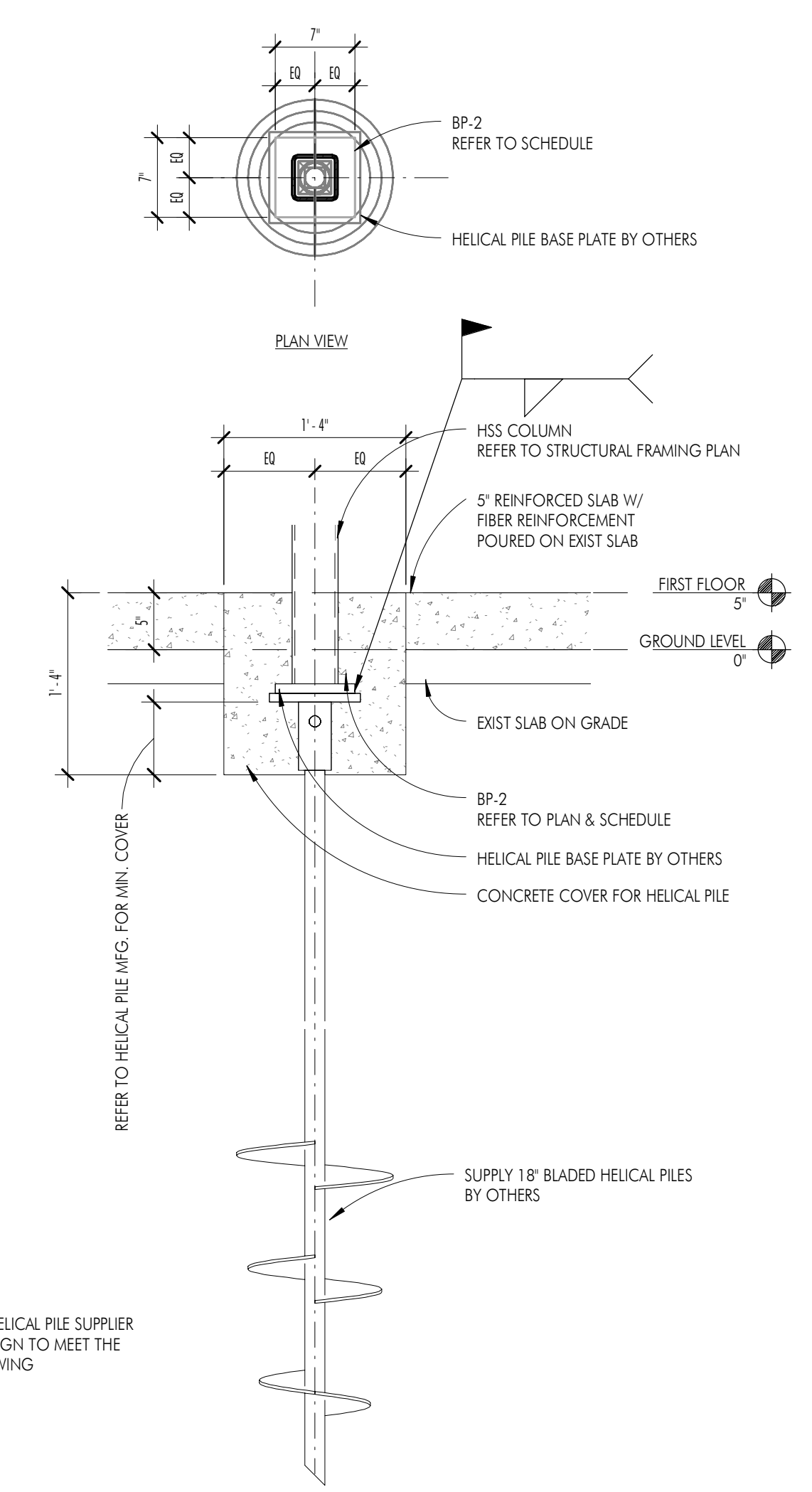


FOUNDATION PLAN - HELICAL PILE LOCATION
SCALE: 3/8" = 1'-0"

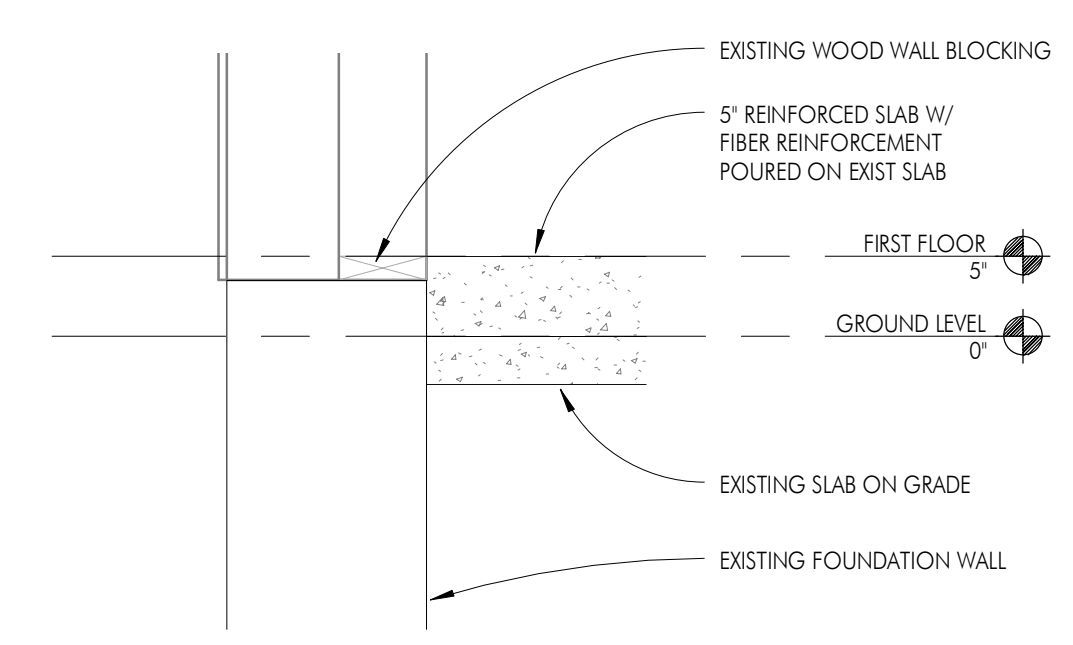
- NOTES:**
1. REFERENCE EXISTING FINISH FIRST FLOOR ELEVATION (0').
 2. NEW FINISHED FIRST FLOOR ELEVATION (5').
 3. REFER TO C100 FOR DESIGN LOADS AND CONCRETE NOTES.
 4. LOADS SHOWN ABOVE ARE SPECIFIED (UNFACTORED) VERTICAL LOADS (DEAD + LIVE LOADS) IN KIPS.
 5. COORDINATE ALL DIMENSIONS AND OPENINGS WITH ARCHITECTURAL DRAWINGS.



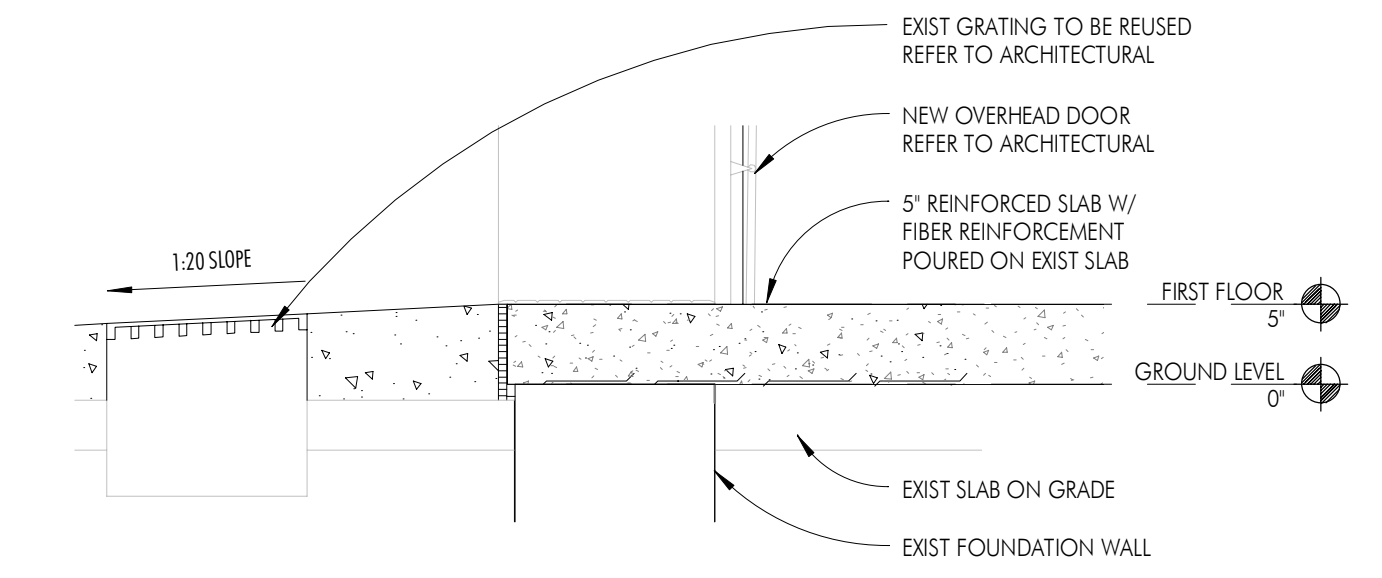
TYP. EXTERIOR HELICAL PILE DETAIL
SCALE: 1" = 1'-0"



TYP. INTERIOR HELICAL PILE DETAIL
SCALE: 1" = 1'-0"



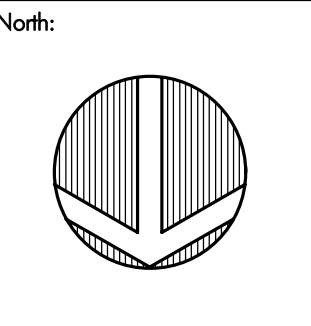
201A C201
DETAIL @ SLAB PERIMETER
SCALE: 1" = 1'-0"



2018 C201
DETAIL @ OVERHEAD DOOR SLAB
SCALE: 1" = 1'-0"

2	TENDER	2015 12 02	MV
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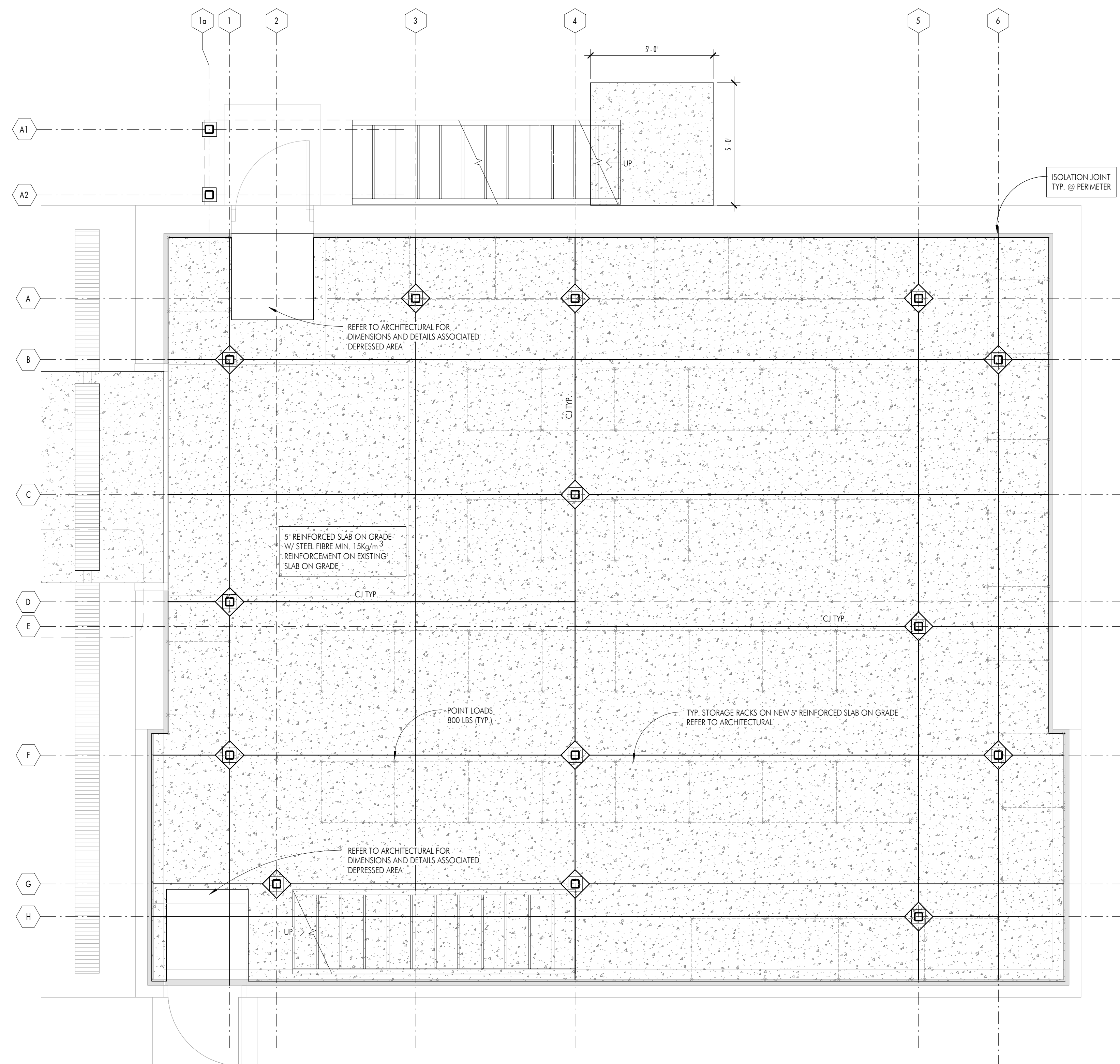
Project Name:
BUILDING #73 RENOVATION
2585 COUNTY ROAD 20
HARROW, ONTARIO

Client:
AGRICULTURE AND AGRI-FOOD CANADA
HARROW, ONTARIO

Sheet Title:
FOUNDATION PLANS

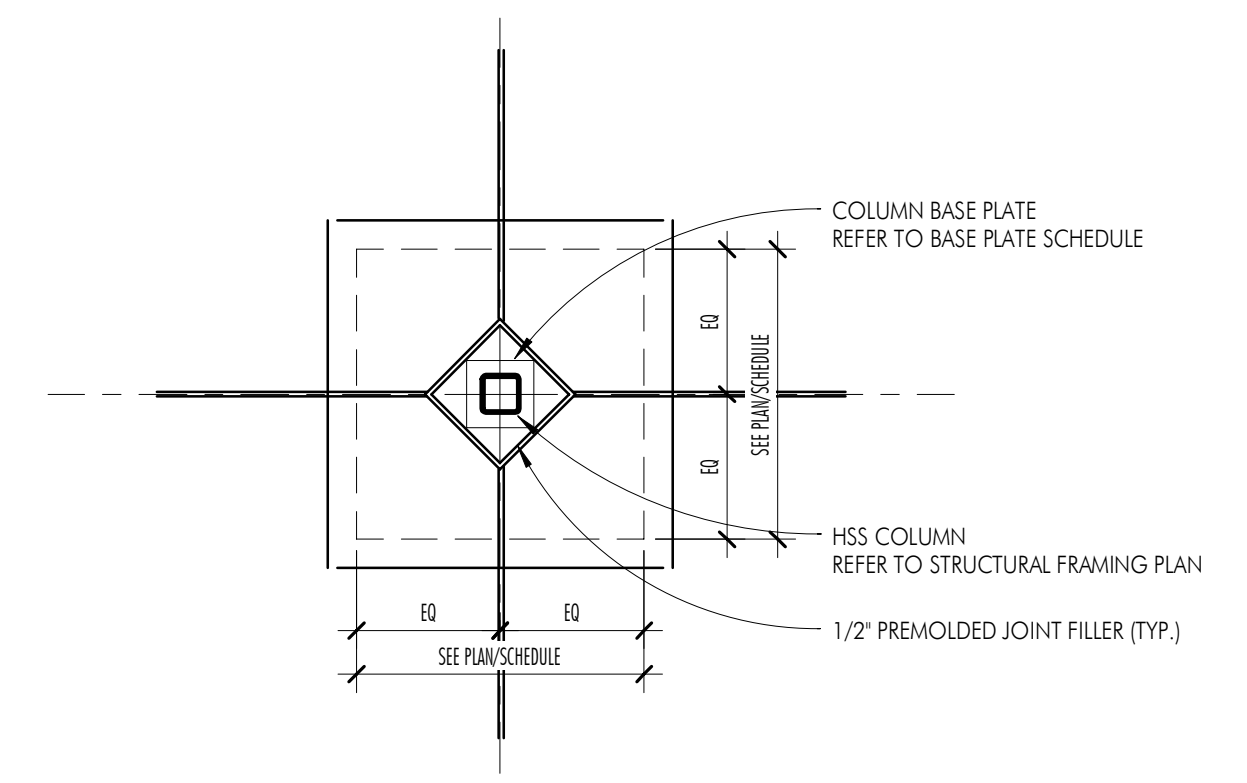
Design By: MV
Drawn By: CM
Checked By: MV
Project No:

Sheet No:
15084 | C201

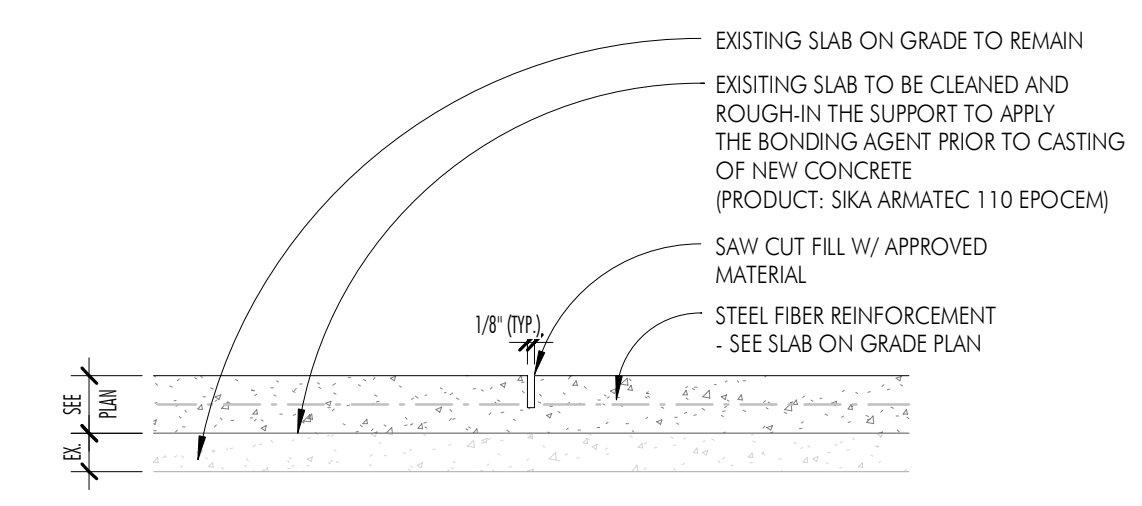


SLAB ON GRADE
SCALE: 3/8" = 1'-0"

- CONCRETE MIX DESIGN
- COMPRESSIVE STRENGTH 30 MPa
 - MINIMUM 285 kg/m³ CEMENT
 - SLAG 10 - 20kg/m³
 - NO FLY ASH
 - USE 40/20 BLENDED AGGREGATE MIX
 - ADD PLASTIZER TO COMPENSATE FOR SLUMP REDUCTION DUE TO FIBRE



TYP. COLUMN ISOLATION JOINT DETAIL



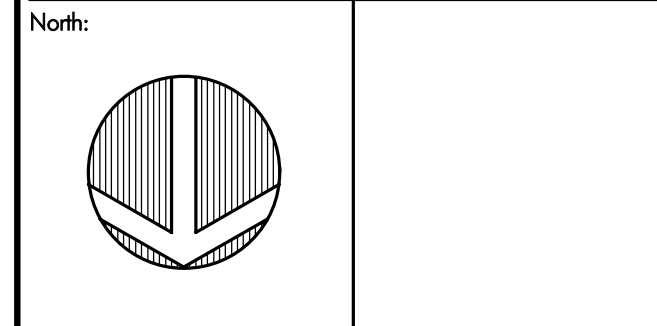
TYPICAL CONTROL JOINT (SAW CUT)

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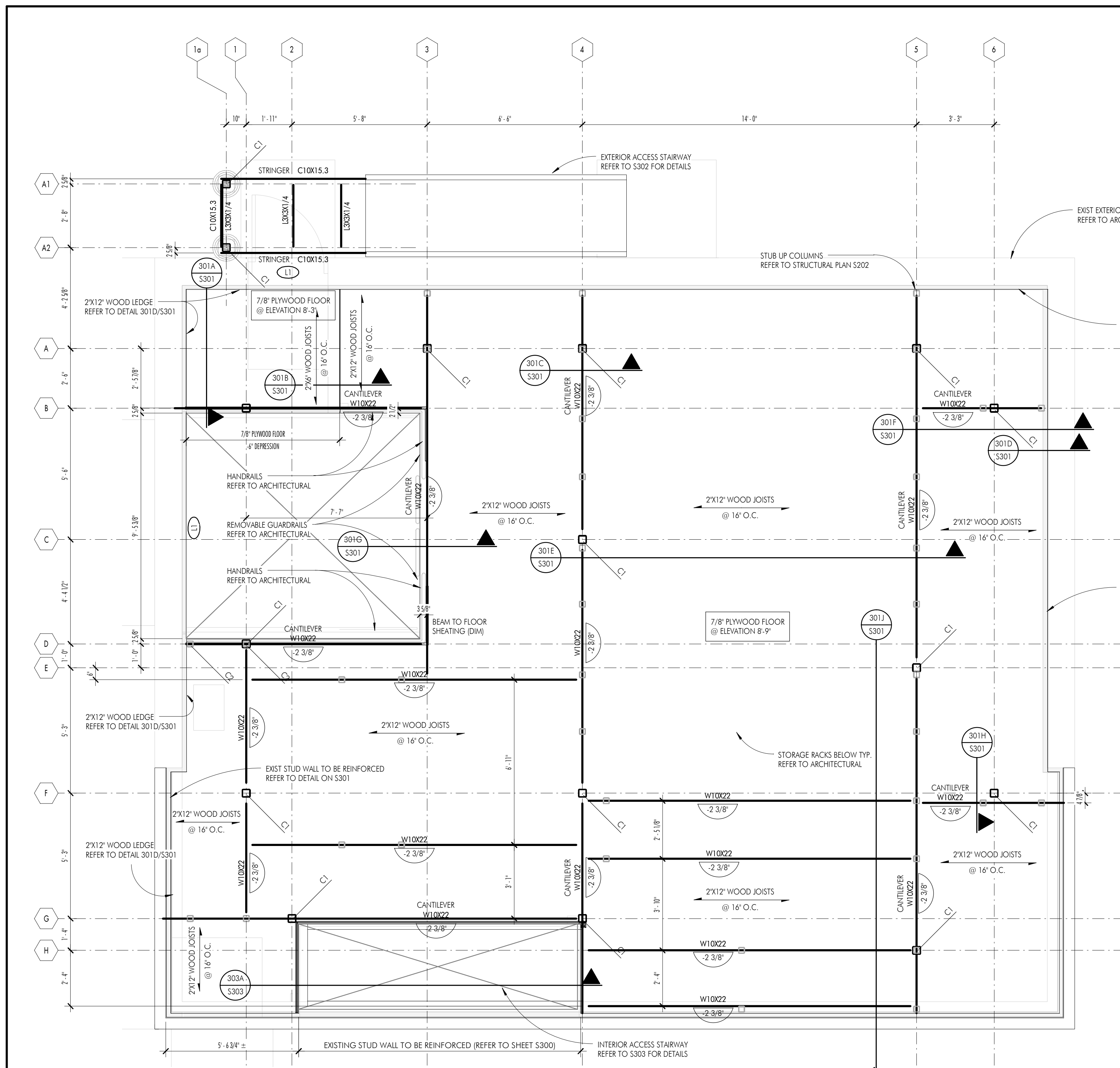
Project Name:
BUILDING #73 RENOVATION
2585 COUNTY ROAD 20
HARROW, ONTARIO

Client:
AGRICULTURE AND AGRI-FOOD CANADA
HARROW, ONTARIO

Sheet Title:
SLAB ON GRADE PLAN

Design By: MV
Drawn By: CM
Checked By: MV

Project No: 15084
Sheet No: C202



SECOND FLOOR (EL. 8'-9" U.N.O.)
SCALE: 3/8" = 1'-0"

- NOTES:**
1. REF FINISHED FLOOR ELEV (8'-9")
 2. TOP OF STEEL ELEVATION (8'-6 1/2")
 3. STORAGE RACK SYSTEM ABOVE SHALL BE SUPPORTED ON NEW W4X13 STEEL FRAMING ONLY. PLYWOOD FLOOR IS NOT DESIGNED TO SUPPORT STORAGE RACK SYSTEM.
 4. COORDINATE STORAGE RACKS LAYOUT AND DIMENSIONS WITH ARCHITECTURAL.
 5. REFER TO S100 FOR STRUCTURAL NOTES.
 6. REFER TO S300 FOR GRAPHICAL COLUMN SCHEDULE.
 7. COORDINATE OPENINGS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
 8. INSTALL NEW STEEL LINTELS AT EXISTING MASONRY OPENINGS AS PER DETAILS.
 9. PROVIDE WOOD BLOCKING TO STEEL COLUMNS AT FLOOR AND ROOF LEVEL IN THE DIRECTION WHERE NO STEEL MEMBER IS FRAMED INTO.

REMOVE MASONRY ABOVE EXISTING DOOR TO OPEN NEW DOOR AT 2ND FLOOR LEVEL AND PROVIDE NEW WBX24 LINTEL W/ BRP-1 @ BOTH ENDS



DETAIL ABOVE EXIST DOORWAY
SCALE: N.T.S.



DETAIL ABOVE OVERHEAD DOORWAY
SCALE: N.T.S.

TOP OF EXIST MASONRY WALL	COLUMN LOCATIONS							TOP OF EXIST MASONRY WALL
15'-7"	A3	A4, A5, B1, B6, D1, G2, G4, H5	A1-1a, A2-1a	C4	E5	F1, F6	F4	15'-7"
SECOND FLOOR								SECOND FLOOR
8'-9"								8'-9"
FIRST FLOOR								FIRST FLOOR
5'								5'
Column Locations	A3	A4, A5, B1, B6, D1, G2, G4, H5	A1-1a, A2-1a	C4	E5	F1, F6	F4	

GRAPHICAL COLUMN SCHEDULE
SCALE: 1:100

BEARING PLATE SCHEDULE (BRP)			
TYPE MARK	PLATE SIZE	ANCHORS	COMMENTS
BRP-1	1/2"x2 1/2"x2 1/2"x2"	(1)1 1/2" DIA. HD STUDS X 8" LG.	SEE PLAN

BASE PLATE SCHEDULE						
TYPE MARK	TYPE	COUNT	BASE PLATE LENGTH	BASE PLATE WIDTH	BASE PLATE THICKNESS	ANCHORS
BP-1	1" THK PLATE	17	7'	7'	1"	N/A

COLUMN SCHEDULE					
TYPE MARK	COUNT	TYPE	BASE PLATE	BASE LEVEL	COMMENTS
C1	16	HSS4X4X1/4	BP-1		

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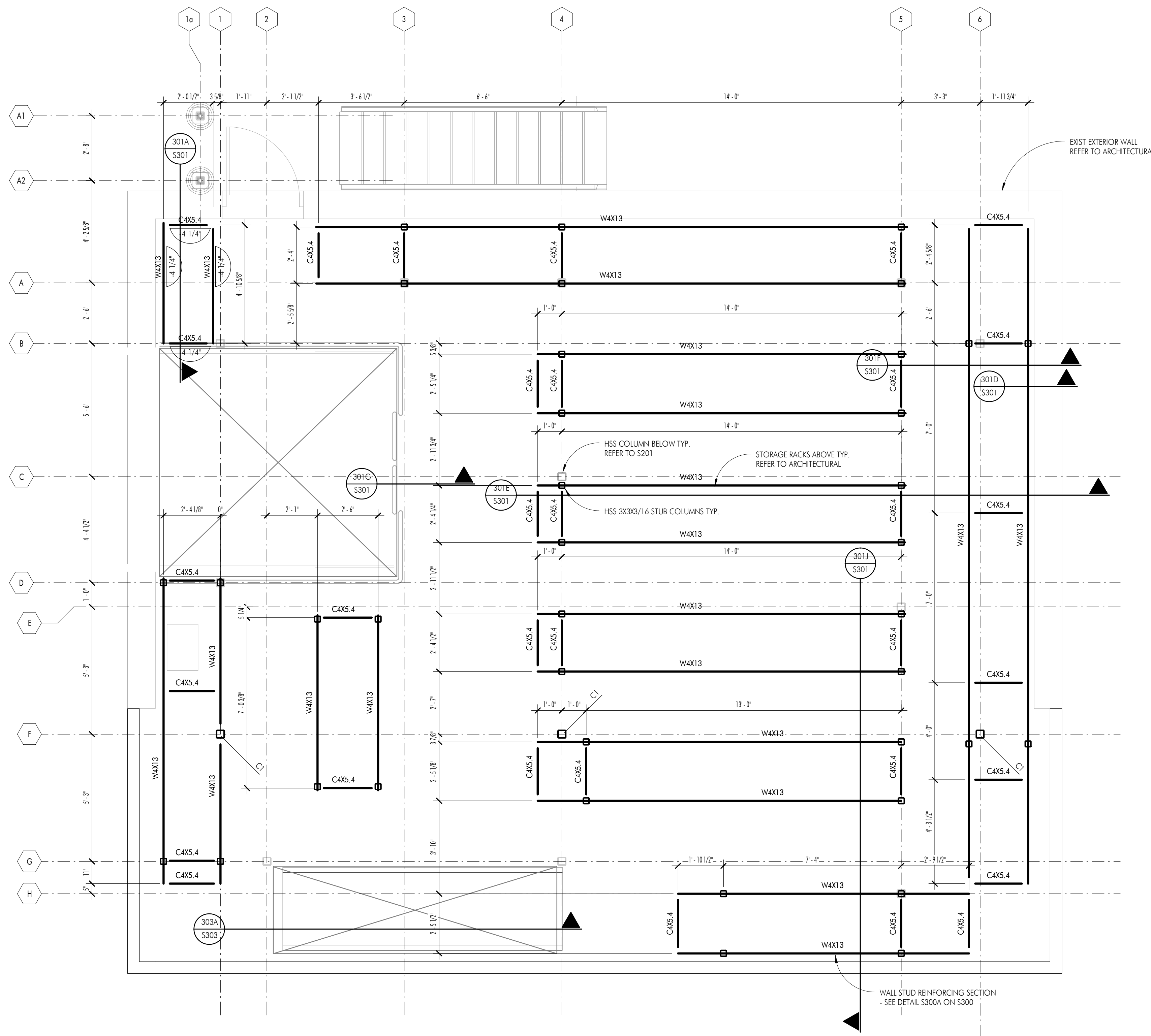
North:
Consultant:
Project Name:

BUILDING #73 RENOVATION
2585 COUNTY ROAD 20
HARROW, ONTARIO
Client: **AGRICULTURE AND AGRI-FOOD CANADA**
HARROW, ONTARIO

Sheet Title: **STRUCTURAL FRAMING PLAN**

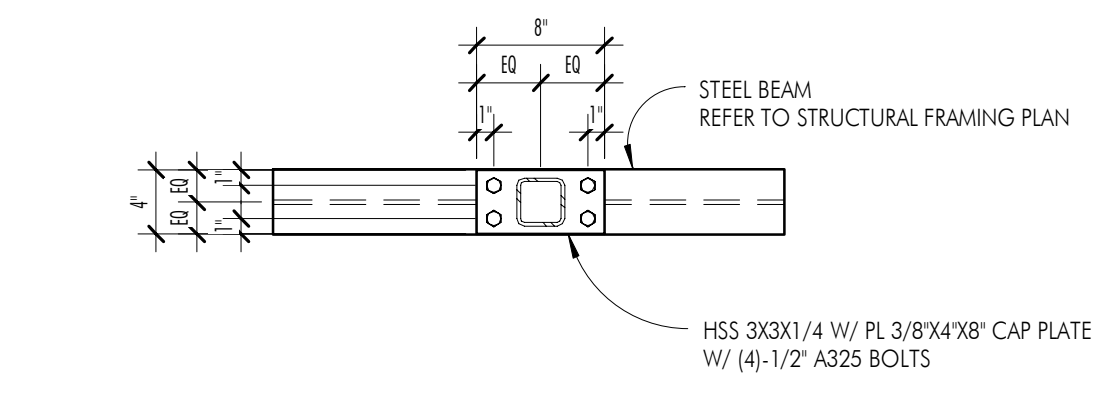
Design By: OM
Drawn By: OM
Checked By: MV
Project No: 15084

Sheet No: **S201**



T.O.S. SUPPORT BEAMS/BTM STORAGE RACKS (EL. 9'-3")
SCALE: 3/8" = 1'-0"

- NOTES:**
1. REF FINISHED FLOOR ELEV (8'-9")
 2. TOP OF STEEL ELEVATION (8'-4 1/2")
 3. STORAGE RACK SYSTEM ABOVE SHALL BE SUPPORTED ON NEW W4X13 STEEL FRAMING ONLY. PLYWOOD FLOOR IS NOT DESIGNED TO SUPPORT STORAGE RACK SYSTEM.
 4. COORDINATE STORAGE RACKS LAYOUT AND DIMENSIONS WITH ARCHITECTURAL.
 5. REFER TO S100 FOR STRUCTURAL NOTES.
 6. REFER TO S300 FOR GRAPHICAL COLUMN SCHEDULE.
 7. COORDINATE OPENINGS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
 8. INSTALL NEW STEEL LINTELS AT EXISTING MASONRY OPENINGS AS PER DETAILS.
 9. PROVIDE WOOD BLOCKING TO STEEL COLUMNS AT FLOOR AND ROOF LEVEL IN THE DIRECTION WHERE NO STEEL MEMBER IS FRAMED INTO.



1 TYP. STUB COLUMN CAP PLATE DETAIL
SCALE: 1" = 1'-0"

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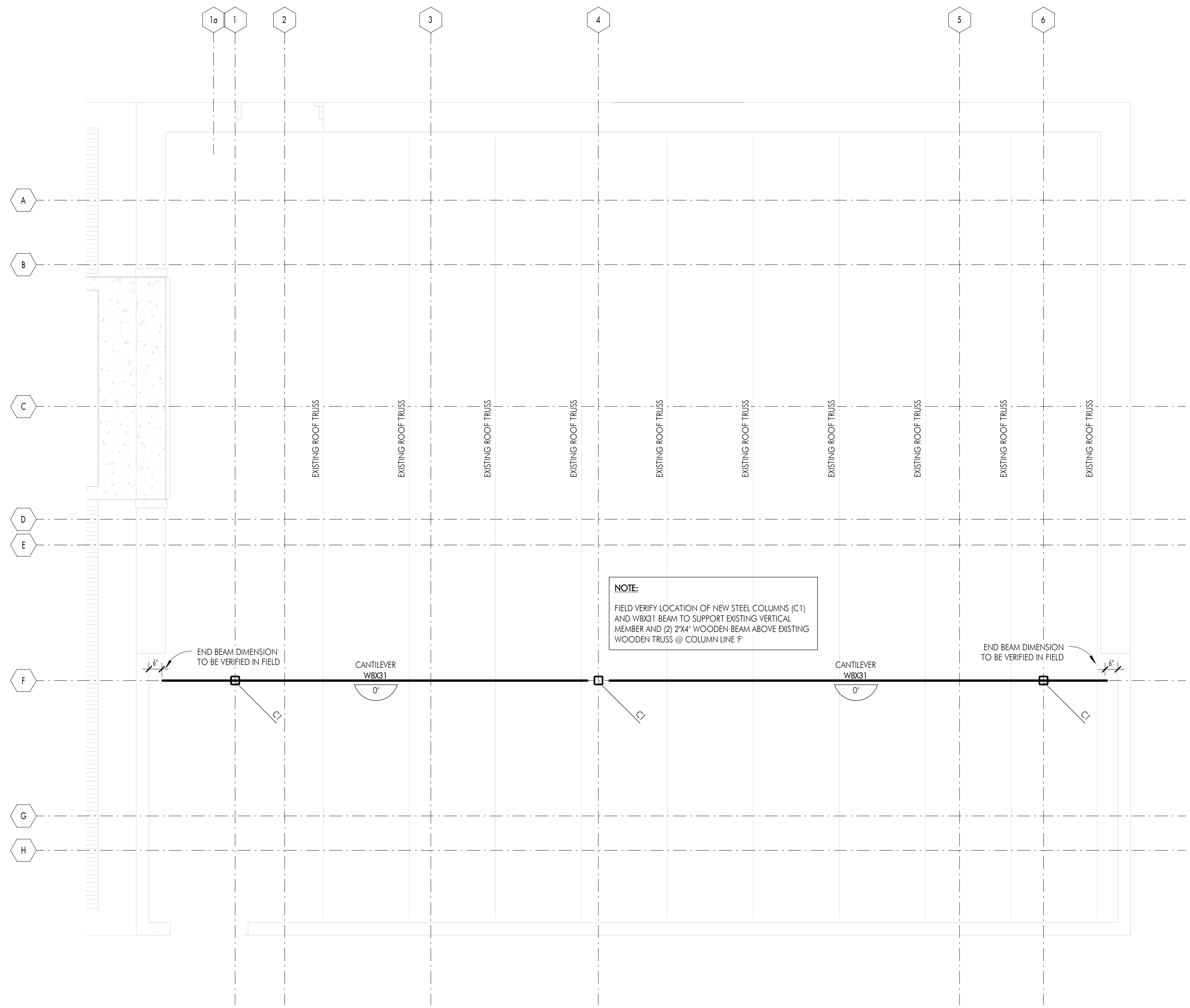
Project Name:
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HARROW, ONTARIO

Client:
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HARROW, ONTARIO

Sheet Title:
STRUCTURAL FRAMING PLAN

Design By: OM
Drawn By: OM
Checked By: MV
Project No: Sheet No:

15084 | S202



ROOF RAFTER BEAM SUPPORT PLAN
SCALE: 3/8" = 1'-0"



DETAIL ABOVE EXIST INTERIOR MASONRY WALL
SCALE: N.T.S.

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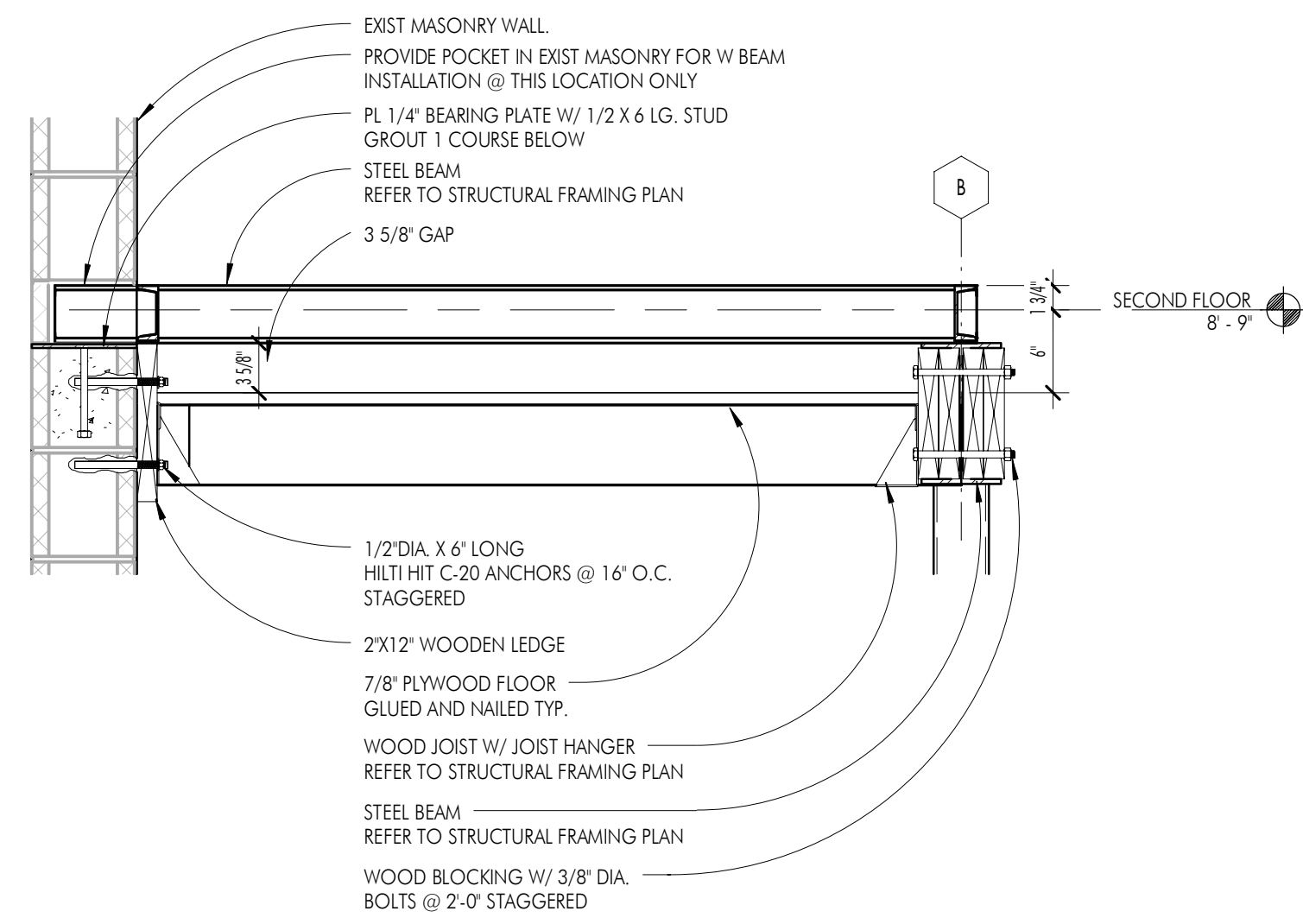
North:
Consultant:

Project Name:
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2585 COUNTY ROAD 20
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Client:
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HARROW, ONTARIO

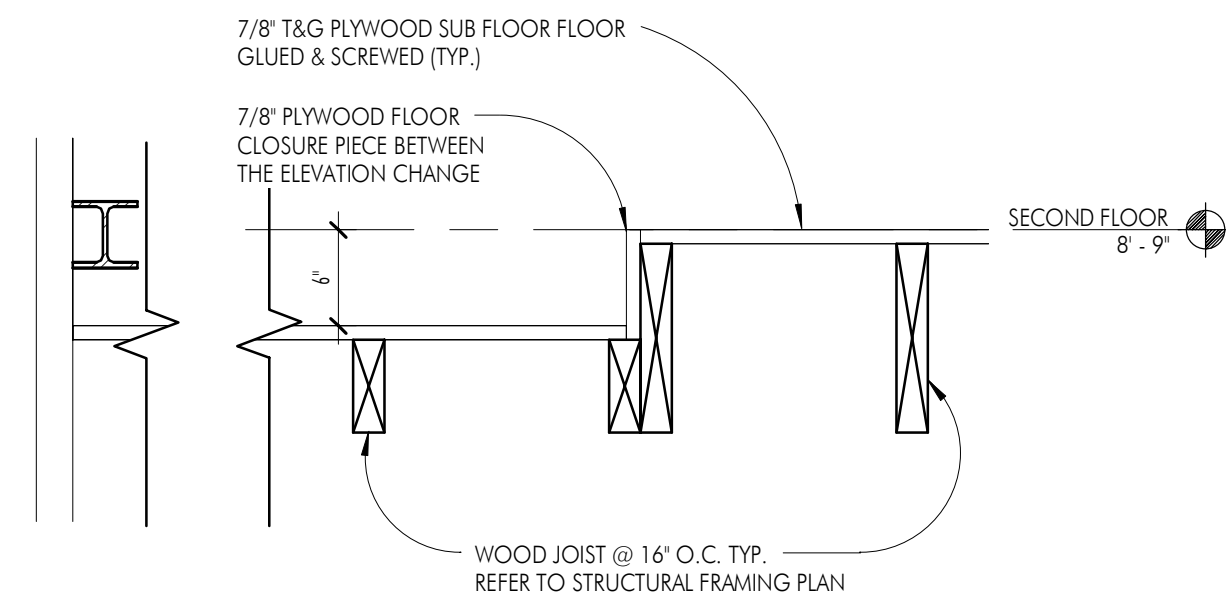
Sheet Title:
STRUCTURAL ROOF FRAMING PLAN

Design By: OM
Drawn By: OM
Checked By: MV

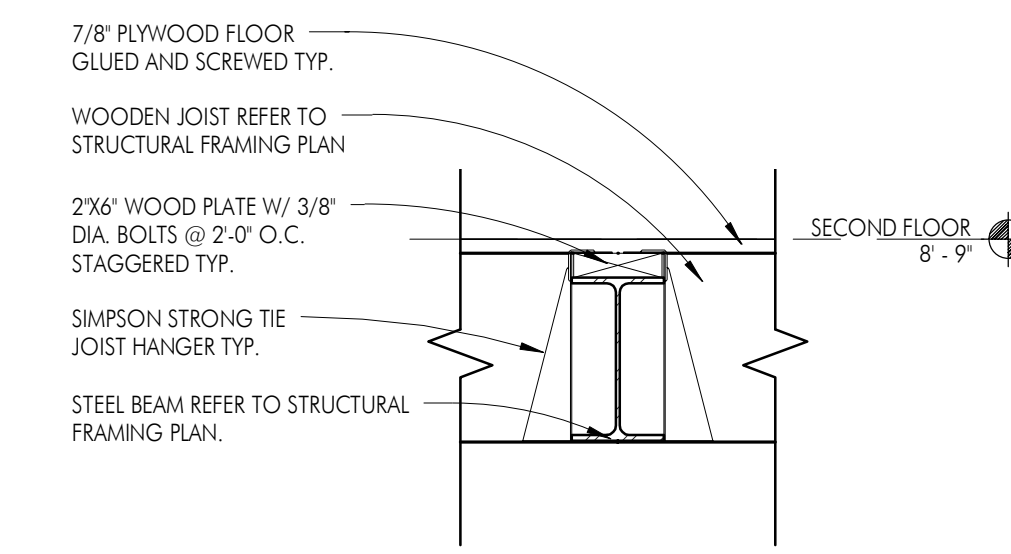
Project No: 15084
Sheet No: S203



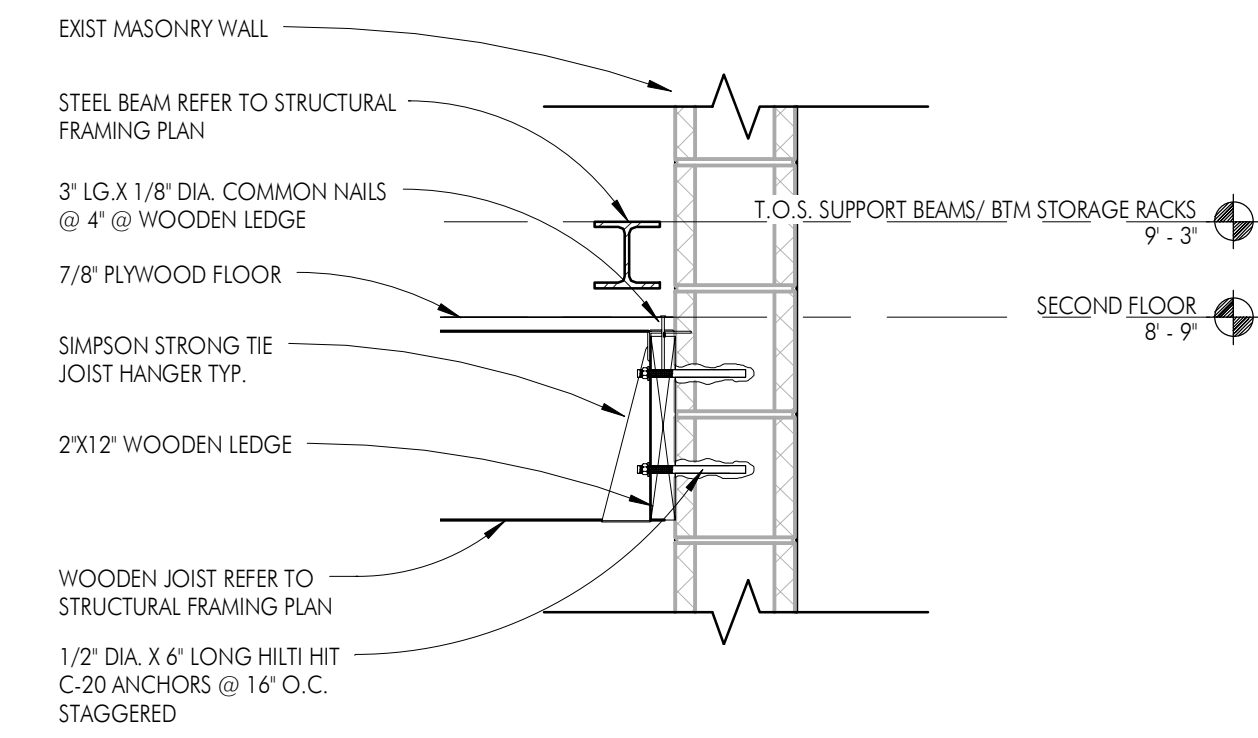
301A
S201
DETAIL @ RECESSED FLOOR RACK FRAMING
SCALE: 1" = 1'-0"



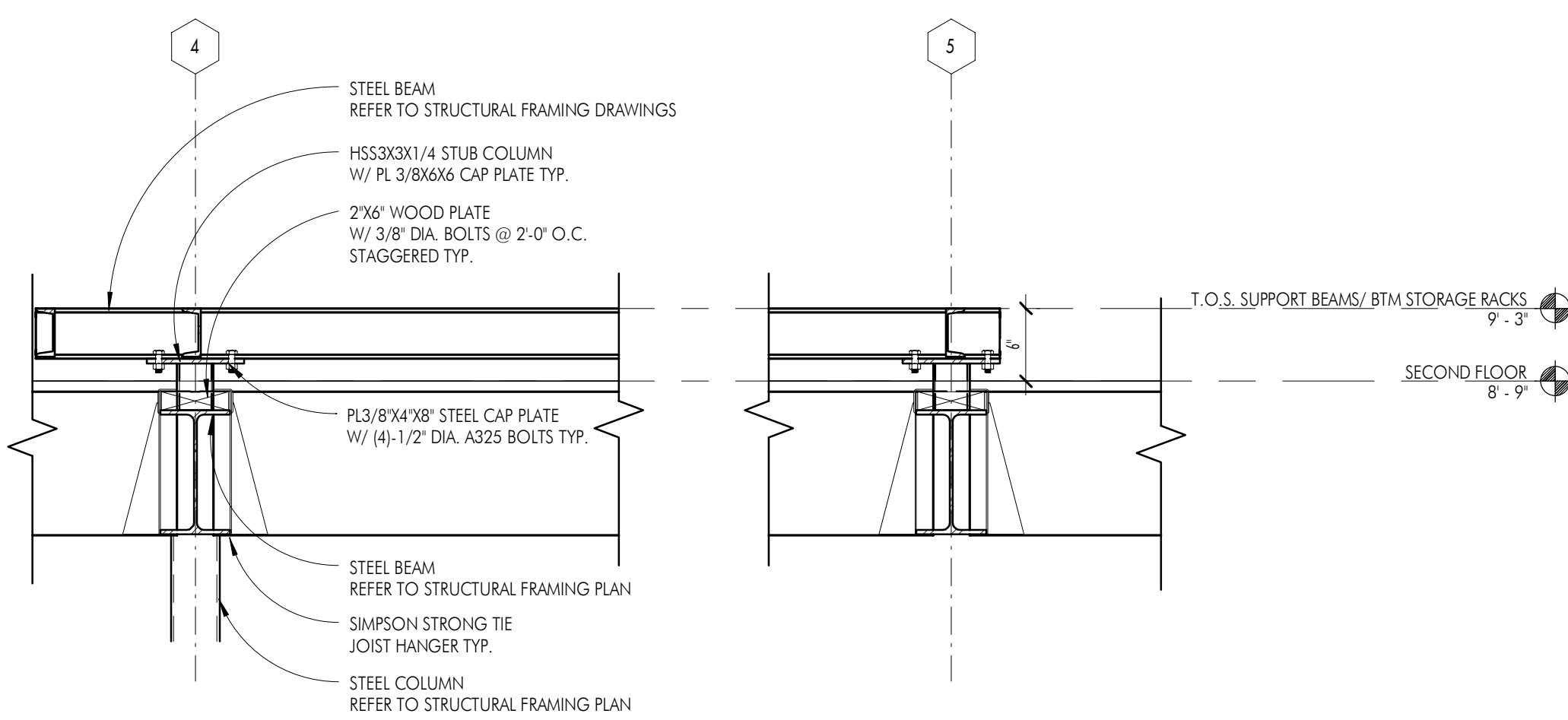
301B
S201
DETAIL @ RECESSED FLOOR
SCALE: 1" = 1'-0"



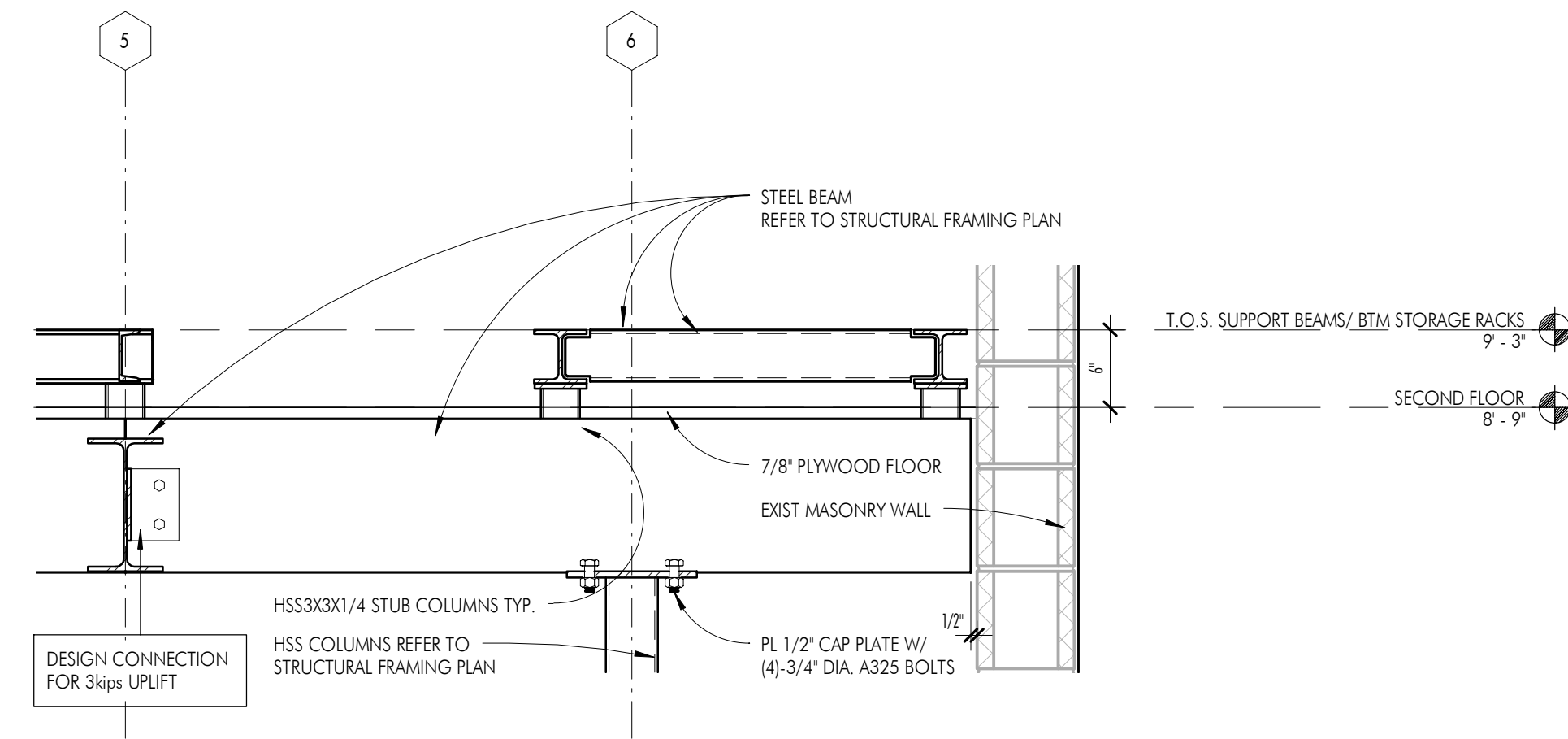
301C
S201
WOOD JOIST CONNECTION DETAIL TO STEEL BEAM TYP.
SCALE: 1" = 1'-0"



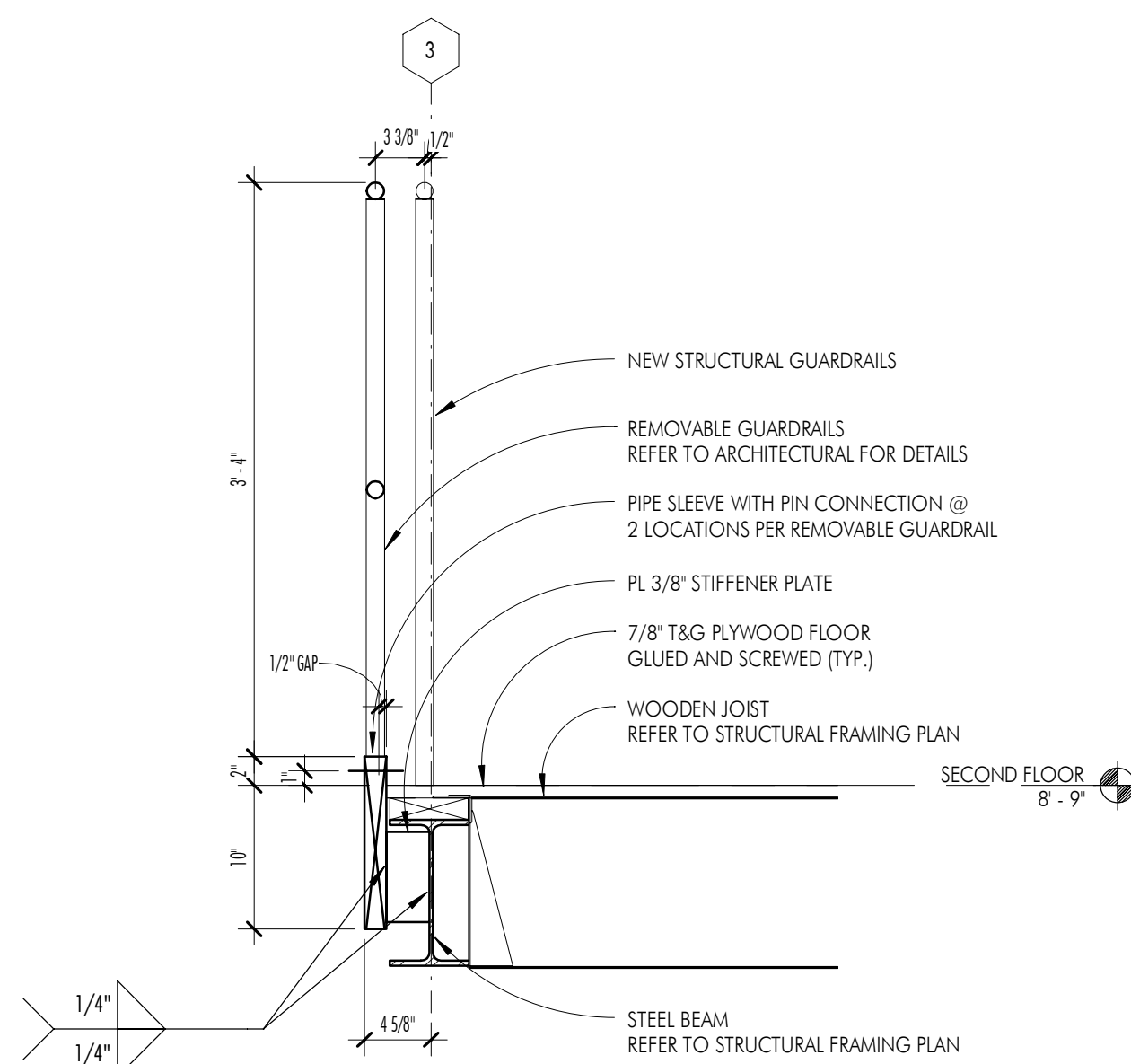
301D
S201
DETAIL @ EXIST MASONRY WALL
SCALE: 1" = 1'-0"



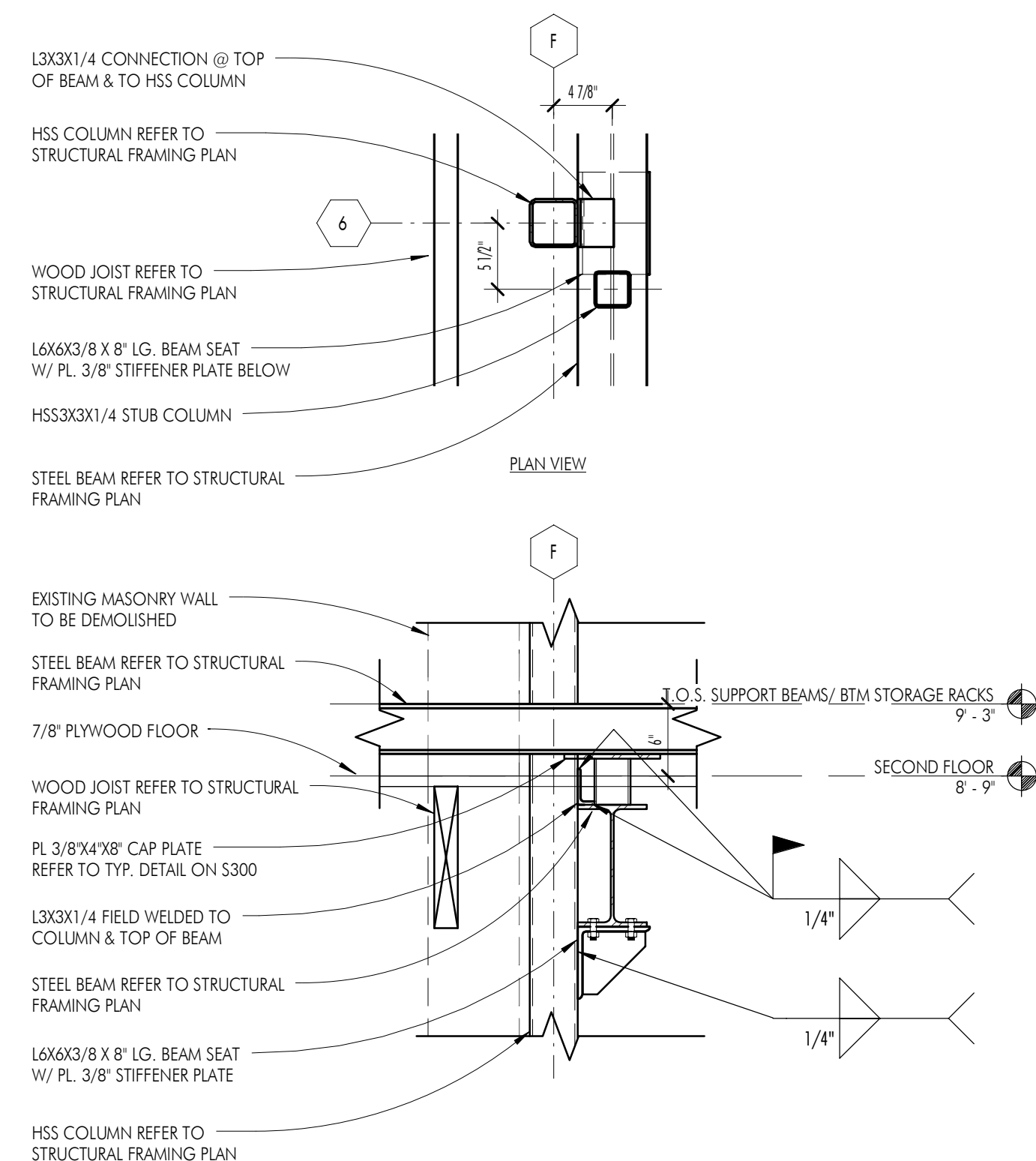
301E
S201
DETAIL @ STORAGE RACK BASE
SCALE: 1" = 1'-0"



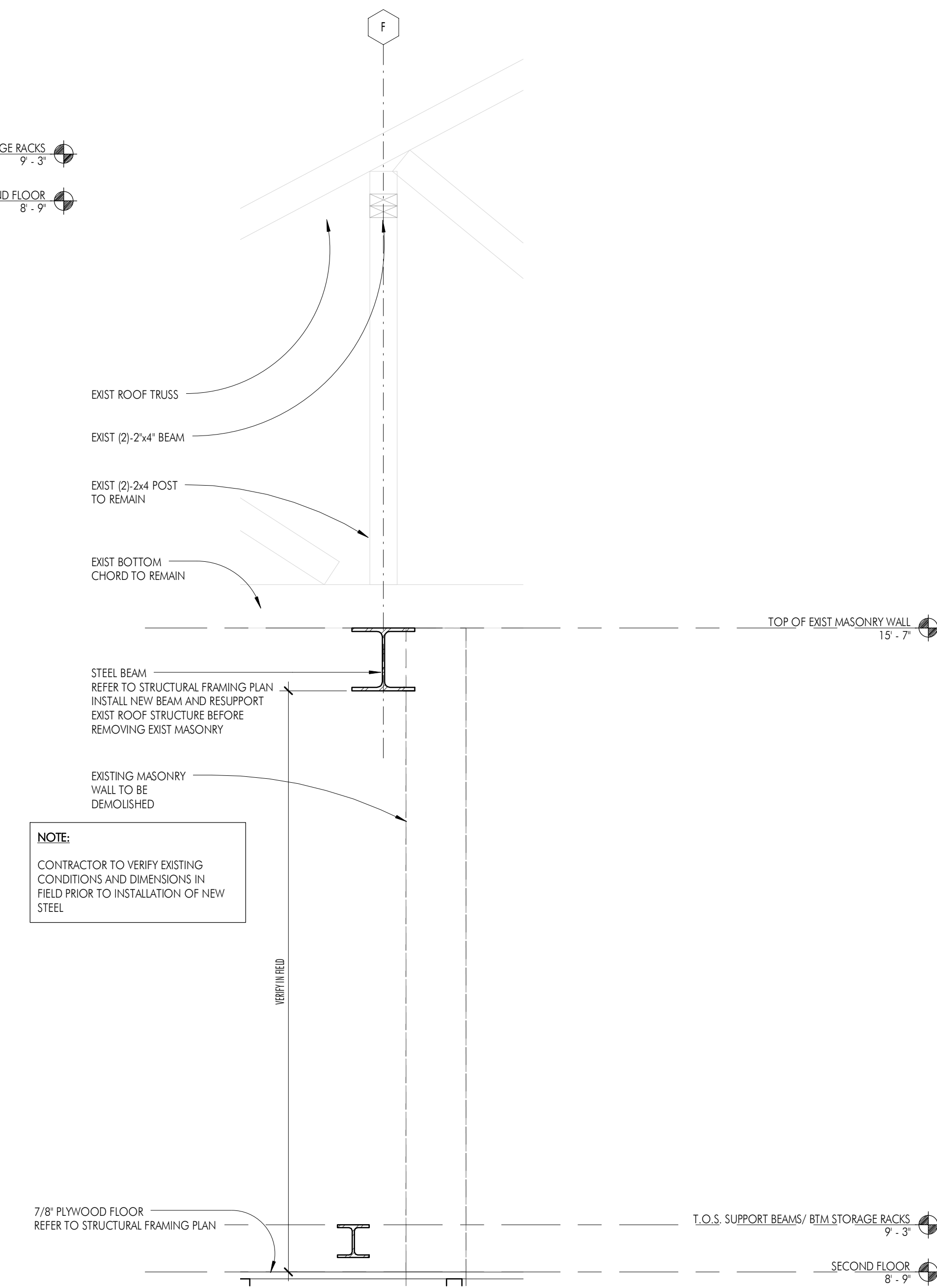
301F
S201
BEAM CONNECTION DETAIL
SCALE: 1" = 1'-0"



301G
S201
DETAIL @ GUARDRAILS
SCALE: 1" = 1'-0"



301H
S201
CONNECTION DETAIL @ HSS TO W BEAM
SCALE: 1" = 1'-0"



301J
S201
DETAIL @ EXIST ROOF TRUSS
SCALE: 1" = 1'-0"

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Consultant:

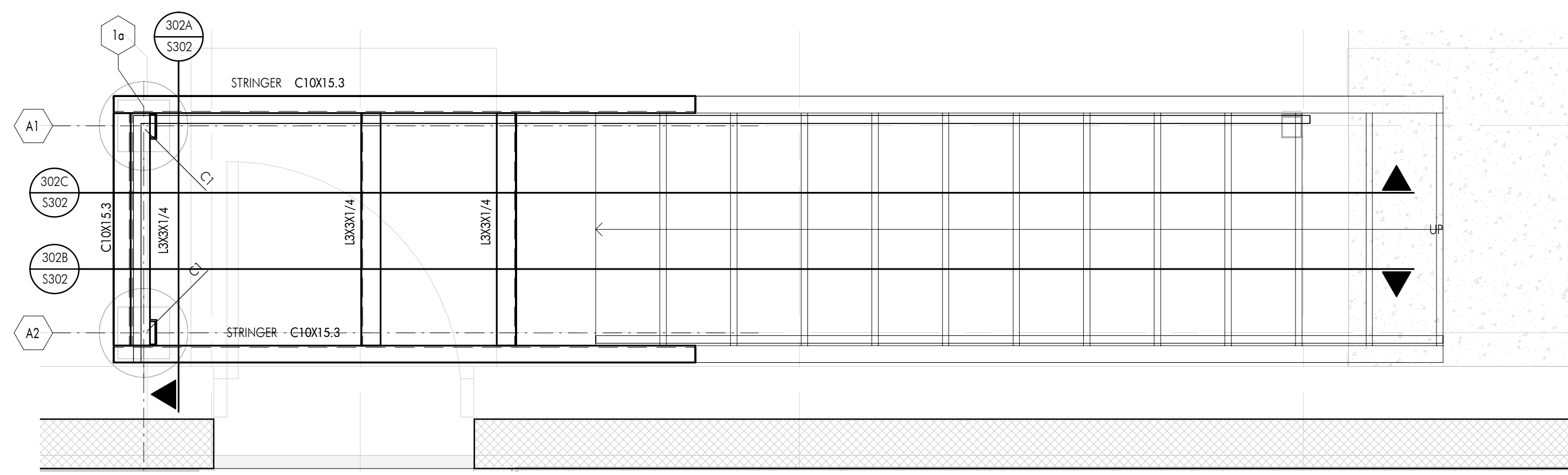
Project Name:
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HARROW, ONTARIO

Client:
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HARROW, ONTARIO

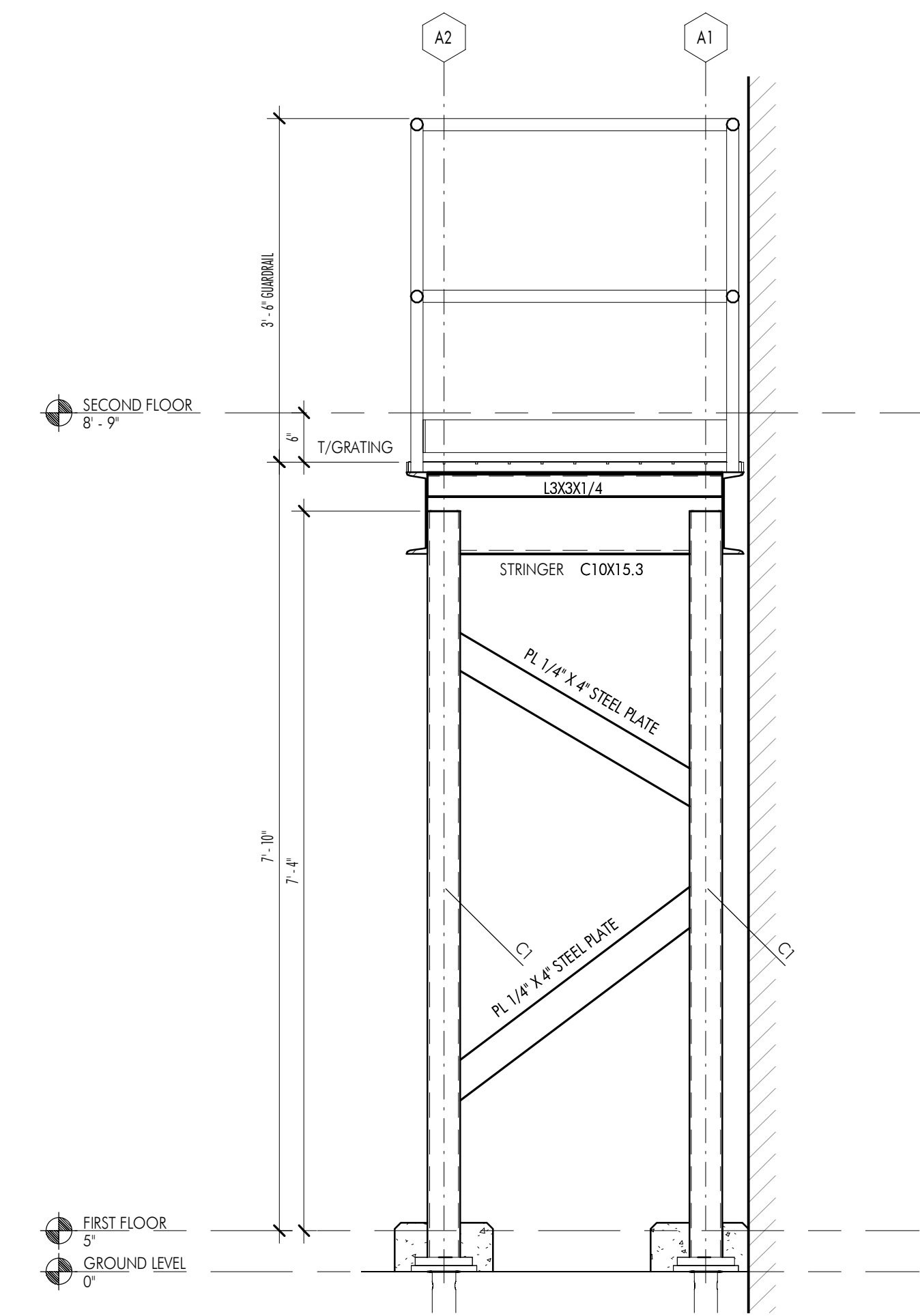
Sheet Title:
STRUCTURAL DETAILS

Design By: OM
Drawn By: OM
Checked By: MV
Project No:

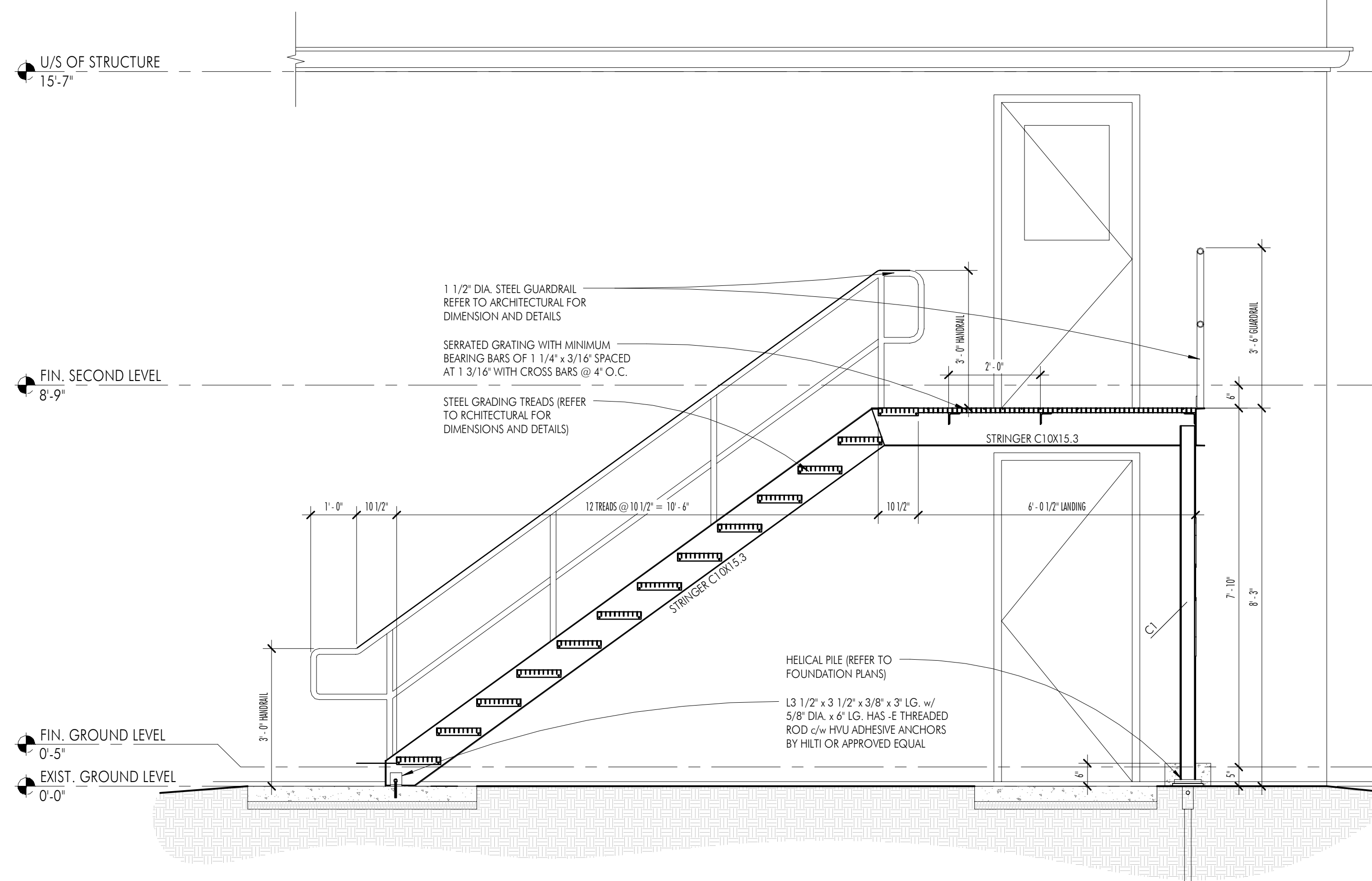
Sheet No:
15084 | S301



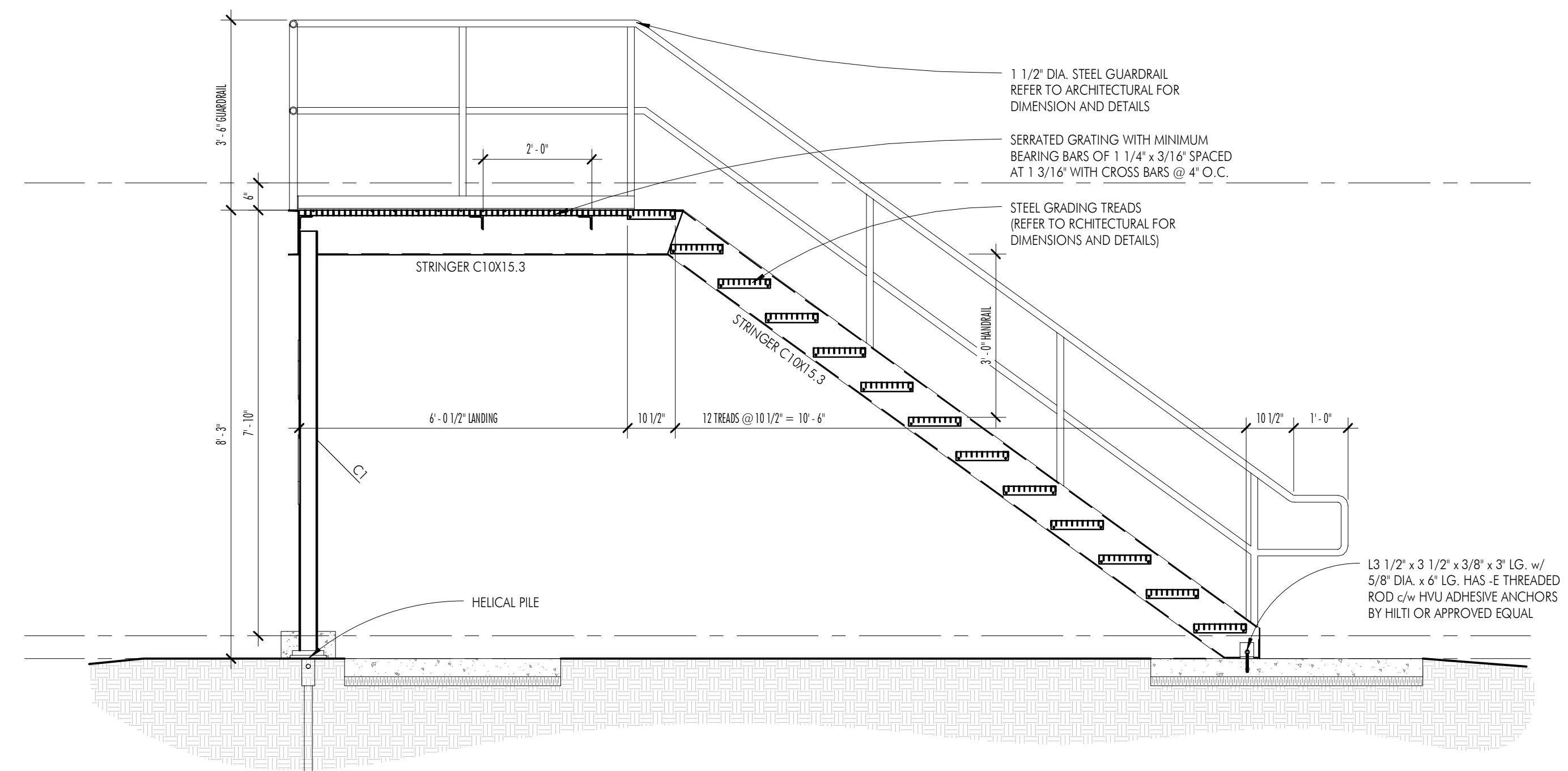
ENLARGED PLAN - EXTERIOR ACCESS STAIRWAY
SCALE: 3/4" = 1'-0"



302A
S302
DETAIL @ EXTERIOR STAIRS
SCALE: 3/4" = 1'-0"



302B
S302
EXTERIOR STAIR SECTION
SCALE: 1/2" = 1'-0"



302C
S302
EXTERIOR STAIR SECTION
SCALE: 1/2" = 1'-0"

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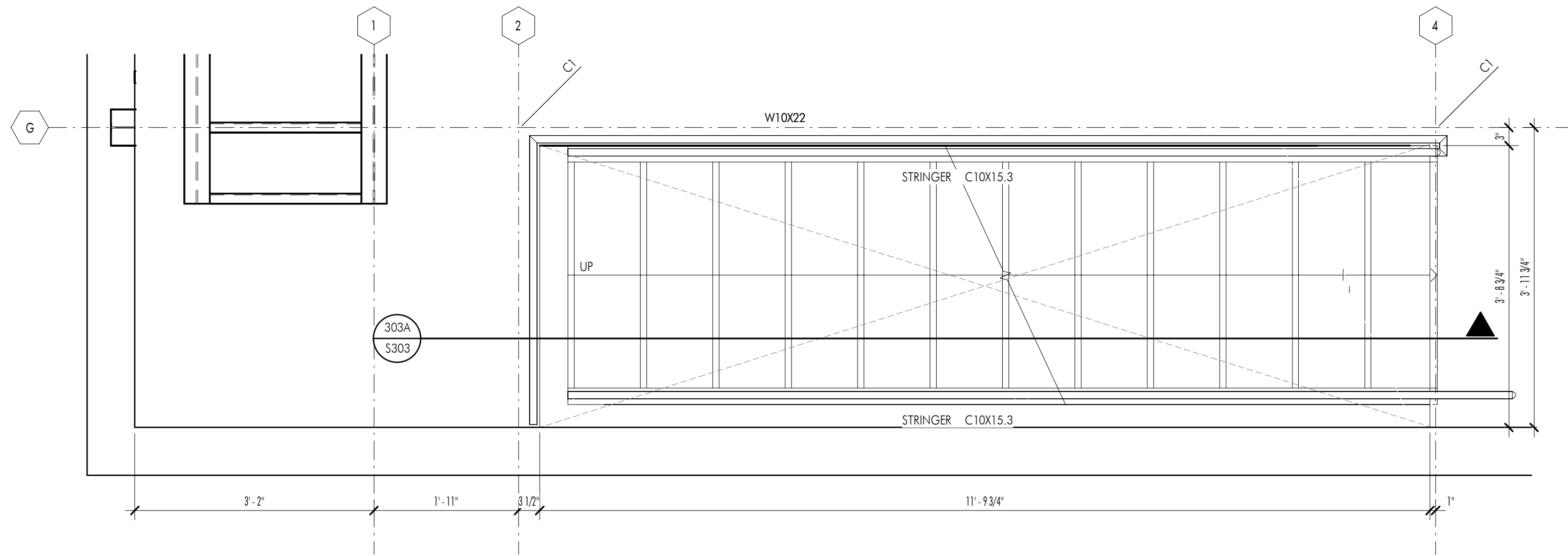
Consultant:

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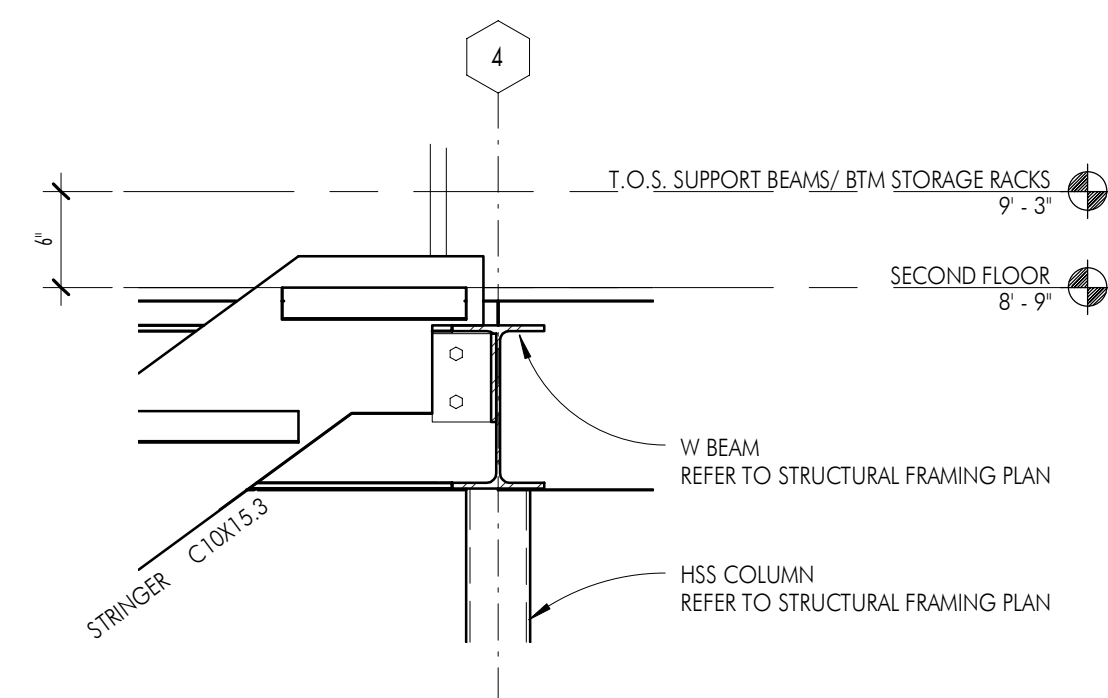
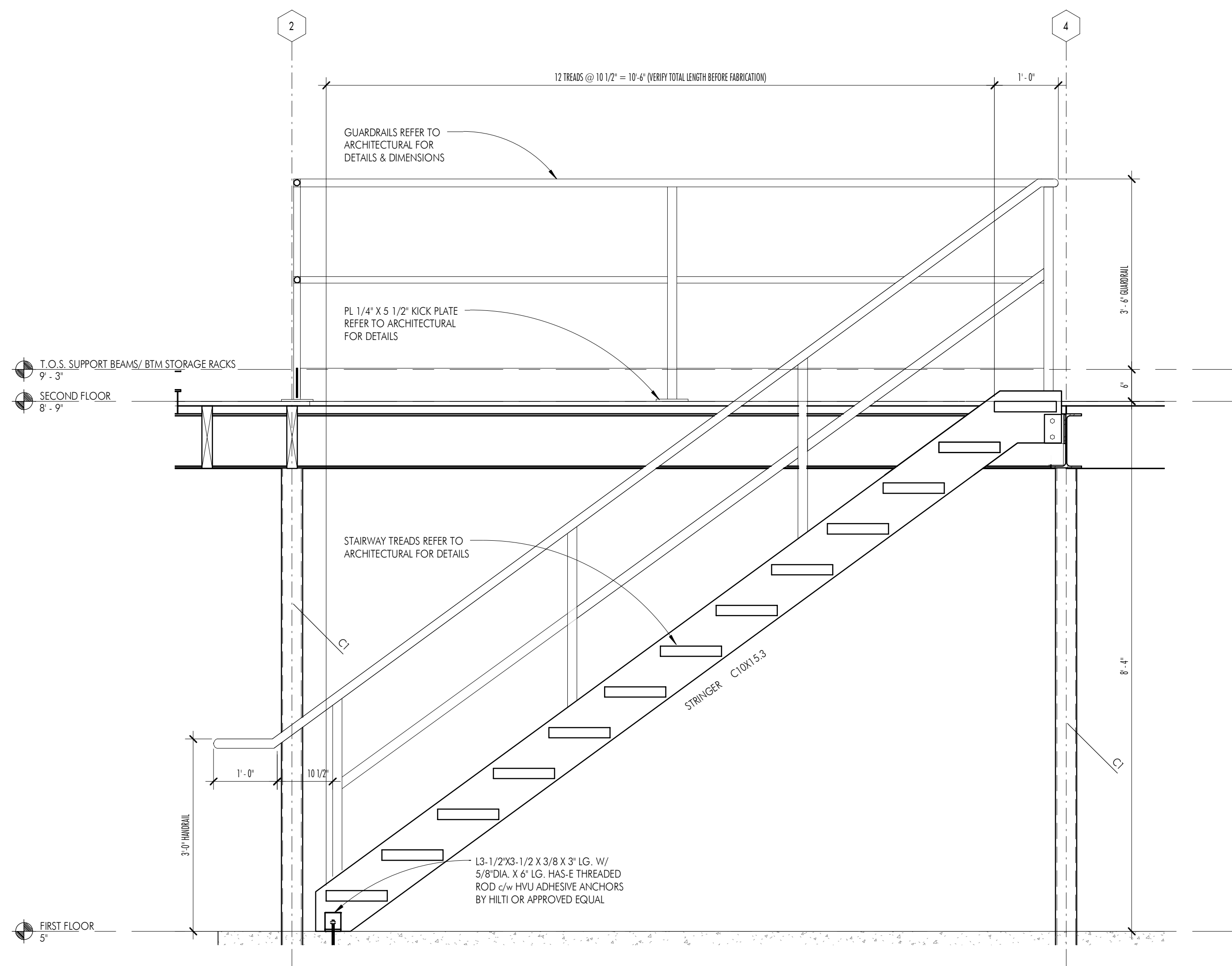
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HARROW, ONTARIO

Sheet Title:
STRUCUTRAL DETAILS

Design By: OM
Drawn By: OM
Checked By: MV
Project No: 15084
Sheet No: S302



ENLARGED PLAN - INTERIOR ACCESS STAIRWAY
SCALE: 3/4" = 1'-0"



DETAIL @ CHANNEL STRINGER
SCALE: 1" = 1'-0"

303A
S201
DETAIL @ INTERIOR ACCESS STAIRWAY
SCALE: 3/4" = 1'-0"

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The contractor must verify and accept responsibility for all dimensions and conditions on site and most notably Glos Associates Inc. of any variations from the supplied information.
This drawing is NOT to be scaled.
This discipline is not responsible for the accuracy of survey, or other disciplines information shown on this drawing. Refer to the appropriate consultant's drawings before proceeding with this work.
Construction must conform to all applicable codes and standards of authorities having jurisdiction.
The contractor working from drawings of specifically noted For Construction must assume full responsibility and be liable for any corrections or damages resulting from their work.

PRELIMINARY - NOT FOR CONSTRUCTION

2	TENDER	2015 12 02	MV
1	CLIENT REVIEW	2015 11 18	MV
No. Issued for:		Date:	By:

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North:

Consultant:

Project Name:
BUILDING #73 RENOVATION
2585 COUNTY ROAD 20
HARROW, ONTARIO

Client:
AGRICULTURE AND AGRI-FOOD CANADA
HARROW, ONTARIO

Sheet Title:
STRUCTURAL DETAILS

Design By: OM
Drawn By: OM
Checked By: MV
Project No:

Sheet No:
15084 | S303

PROJECT TITLE

HARROW RESEARCH FACILITY
Building #73 Renovations

PROJECT NUMBER

15084

PROJECT DATE

2015 11 30

PREPARED BY

GLOS ASSOCIATES INC.
3535 NORTH SERVICE ROAD EAST
WINDSOR, ONTARIO
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PART 1 - GENERAL

1.1 RELATED
REQUIREMENTS

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under sections as follows:

1.2 APPOINTMENT AND
PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory except follows:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Mill tests and certificates of compliance.
 - .4 Tests specified to be carried out by Contractor under supervision of Departmental Representative.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S
RESPONSIBILITIES

- .1 Provide labour, equipment and facilities to:
- .2 Provide access to Work for inspection and RE testing.
 - .1 Facilitate inspections and tests.
 - .2 Make good Work disturbed by

- inspection and test.
- .3 Provide storage on site for exclusive use to store equipment and cure samples
- .3 Notify Departmental Representative 48 hours minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .4 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .5 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Coordination Work with other contractors and work by Owner under administration of Departmental Representative.
- .2 Scheduled progress, meetings.
- 1.2 DESCRIPTION .1 Coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction Work, with progress of Work of other contractors and Work by Owner, under instructions of Departmental Representative.
- 1.3 PROJECT .1 Schedule and administer bi-weekly meeting project meetings throughout progress of Work as determined by Departmental Representative.
- .2 Prepare agenda for meetings.
- .3 Preside at meetings.
- .4 Record minutes. Include significant proceedings and decisions. Identify action by parties.
- .5 Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants, affected parties not in attendance, Departmental Representative.
- 1.4 CONSTRUCTION ORGANIZATION AND START-UP .1 Within 2 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

- .2 Senior representatives of the Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include following:
 - .1 Appointment of official representative of participants in Work.
 - .2 Schedule of Work
 - .3 Schedule of submission of shop drawings, samples, colour chips in accordance with Section 01 33 00.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00.
 - .5 Delivery schedule of specified equipment.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements (GC).
 - .7 Departmental Representative Products.
 - .8 Record drawings in accordance with Section 01 78 00.
 - .9 Maintenance in accordance with Section 01 78 00.
 - .10 Take-over procedures, acceptance, and warranties in accordance with Section 01 78 00.
 - .11 Monthly progress claims, administrative procedures, photographs, and holdbacks (GC).
 - .12 Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00.

- .6 Comply with Departmental Representative's allocation of mobilization areas of site; for, access, traffic, and parking facilities.
- .7 During construction coordinate use of site and facilities through Departmental Representative's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
- .8 Comply with instructions of Departmental Representative for use of temporary utilities and construction facilities.
- .9 Coordinate field engineering and layout work with Departmental Representative.

1.5 ON-SITE DOCUMENTS

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Amendments.
 - .4 Reviewed shop drawings.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Field test reports.
 - .8 Copy of approved Work schedule.
 - .9 Manufacturers' installation and application instructions.
 - .10 Labour conditions and wage schedules.
 - .11 Material Safety Data Sheets.
 - .12 Labour and Material Bonds.
 - .13 All applicable Municipal Permits.

1.6 SCHEDULES

- .1 Submit preliminary construction progress schedule in accordance with Section 01 32 00 and Commissioning Schedule in accordance to Departmental Representative coordinated with Departmental Representative's project schedule.

- .2 After review, revise and resubmit schedule to comply with revised project schedule.
- .3 During progress of Work revise and resubmit as directed by Departmental Representative.

1.7 CONSTRUCTION
PROGRESS MEETINGS

- .1 Schedule bi-weekly construction meetings.
- .2 Contractor, major subcontractors involved in Work and Departmental Representative and Owner are to be in attendance.
- .3 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.
- .4 Agenda to include following:
 - .1 Review, approval of minutes of previous meeting
 - .2 Review of Work progress since previous meeting
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule
 - .5 Review of off-site fabrication delivery schedules
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period
 - .9 Review submittal schedules: expedite as required
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for affect on construction schedule and on completion date.
 - .12 Other business

1.8 SUBMITTALS

- .1 Submit preliminary shop drawings, product data and samples in accordance with Section 01 33 00 for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other

contracts.

- .2 After review, revise and resubmit for transmittal to Departmental Representative.
- .3 Submit requests for payment for review, and for transmittal to Departmental Representative.
- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Departmental Representative.
- .5 Process substitutions through Departmental Representative
- .6 Process change orders through Departmental Representative
- .7 Deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative.

1.9 COORDINATION
DRAWINGS

- .1 Provide information required by Departmental Representative for preparation of coordination drawing.
- .2 Review and approve revised drawings for submittal to Departmental Representative.

1.10 CLOSEOUT
PROCEDURES

- .1 Notify Departmental Representative when Work is considered ready for Substantial Performance.
- .2 Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to Owner-occupied areas.
- .4 Notify Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's final inspection.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

Part 1 GENERAL

1.1 SECTION INCLUDES

- .1 Schedules, form, content, submission.
- .2 Critical path scheduling.
- .3 Progress photographs.
- .4 Submittals schedule.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 SCHEDULES

- .1 Submit schedules as follows:
 - .1 Submittal Schedule for Shop Drawings and Product Data.
 - .2 Submittal Schedule for Samples.
 - .3 Submittal Schedule for timeliness of Owner-furnished Products.
 - .4 Product Delivery Schedule.
 - .5 Cash Allowance Schedule for acquiring Products only or Products and Installation, or Installation only.
 - .6 Shutdown or closure activity.
- .2 Schedule Format.
 - .1 Prepare schedule in form of a horizontal bar chart.
 - .2 Provide a separate bar for each major item of work.
 - .3 Split horizontally for projected and actual performance.

- .4 Provide horizontal time scale identifying last Working Day of each week.
- .5 Identification of listings: By specification Section numbers.
- .3 Schedule Submission.
 - .1 Submit initial format of schedules within 2 days after award of Contract.
 - .2 Submit schedules in electronic format, forward through e-mail as *.pdf files.
 - .3 Submit one (1) opaque reproduction, plus Electronic copy to be submitted to Consultant.
 - .4 Consultant will review schedule and return review copy within 2 days after receipt.
 - .5 Resubmit finalized schedule within seven 3 days after return of review copy.
 - .6 Submit revised progress schedule with each application for payment.
 - .7 Distribute copies of revised schedule to:
 - .1 Job site office.
 - .2 Subcontractors.
 - .3 Other concerned parties.
 - .8 Instruct recipients to report to Contractor within ten 3 days, any problems anticipated by timetable shown in schedule.

1.4 CONSTRUCTION PROGRESS

SCHEDULING

- .1 Submit initial schedule in duplicate within 2 days after date of Owner-Contractor Agreement.
- .2 Revise and resubmit as required.

- .3 Submit revised schedules with each Application for Payment, identifying changes since previous version.
- .4 Submit a horizontal bar major portion of Work or operation, identifying first work day of each week.
- .5 Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- .6 Indicate estimated percentage of completion for each item of Work at each submission.
- .7 Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.
- .8 Include dates for commencement and completion of each major element of construction [as follows].
 - .1 Foundation Work.
 - .2 Structural framing.
 - .3 Special Subcontractor Work.
 - .4 Equipment Installations.
 - .5 Finishes.
 - .6 Substantial Completion.
- .9 Indicate projected percentage of completion of each item as of first day of month.
- .10 Indicate progress of each activity to date of submission schedule.
- .11 Indicate changes occurring since previous submission of schedule:
 - .1 Major changes in scope.
 - .2 Activities modified since previous submission.
 - .3 Revised projections of progress and completion.

- .4 Other identifiable changes.
- .12 Provide a narrative report to define:
 - .1 Problem areas, anticipated delays, and impact on schedule.
 - .2 Corrective action recommended and its effect.
 - .3 Effect of changes on schedules of other prime contractors.

1.5 CRITICAL PATH SCHEDULING

- .1 Include complete sequence of construction activities.
- .2 Include dates for commencement and completion of each major element of construction as follows.
 - .1 Foundation Work.
 - .2 Structural framing.
 - .3 Special Subcontractor Work.
 - .4 Equipment Installations.
 - .5 Finishes.
 - .6 Substantial Completion.
- .3 Show projected percentage of completion of each item as of first day of month.
- .4 Indicate progress of each activity to date of submission schedule.
- .5 Show changes occurring since previous submission of schedule:
 - .1 Major changes in scope.
 - .2 Activities modified since previous submission.
 - .3 Revised projections of progress and completion.
 - .4 Other identifiable changes.
- .6 Provide a narrative report to define:
 - .1 Problem areas, anticipated delays, and impact on schedule.

- .2 Corrective action recommended and its effect.
- .3 Effect of changes on schedules of other prime contractors.

1.6 PROGRESS
PHOTOGRAPHS

- .1 Digital Photography:
 - .1 Submit electronic copy of colour digital photography in *.jpg format, minimum 4 megapixel resolution.
 - .2 Identification: Name and number of project and date of exposure indicated.
- .2 Frequency: Monthly with progress statement.
- .3 Frequency: At completion of excavation, framing and services before concealment as directed by Consultant.

1.7 SUBMITTALS SCHEDULE

- .1 Include schedule for submitting shop drawings, product data, samples.
- .2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.
- .3 Include dates when delivery will be required for Owner-furnished products.
- .4 Include dates when reviewed submittals will be required from Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 Shop drawings and product data.
- .2 Samples.
- .3 Certificates and transcripts.

1.2 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Present shop drawings, product data, Commissioning documentation, samples and mock-ups.
- .4 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 shall be considered rejected.
- .5 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

- .6 Verify field measurements and affected adjacent Work are coordinated.
- .7 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of Submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .9 Keep one reviewed copy of each submission on site.
- .10 Submit number of hard copies specified for each type and format of submittal and in also submit in electronic format as pdf files. Forward pdf files on CD or through email.

1.3 SHOP DRAWINGS
AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .3 Where technical sections specify that shop drawings bear the stamp of a Registered Professional Engineer, registered in the Province of Ontario.

- .4 Allow 5 days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of any Revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances
 - .3 Setting or erection details
 - .4 Capacities.
 - .5 Performance characteristics.

- .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
 - .11 Equipment identification.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit 1 electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit 1 electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit 1 electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
- .13 Submit 1 electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

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

- .14 Submit 1 electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

- .15 Submit 1 electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

- .16 Submit 1 electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

- .17 Delete information not applicable to project.

- .18 Supplement standard information to provide details applicable to project.

- .19 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.

.20 The review of shop drawings is for sole purpose of ascertaining conformance with general concept. This review shall not mean that review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.4 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to 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.

1.5 MOCK-UPS .1 Erect mock-ups in accordance with 01 45 00.

1.6 CONSTRUCTION PHOTOGRAPHS .1 Submit electronic and hard copy of colour digital photography in jpg format, fine resolution.
.2 Identification: name and number of project and date of exposure indicated.
.3 Number of viewpoints: determined by Departmental Representative.
.4 Frequency: monthly with progress statement and as directed by Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA): Canada
 - .1 CSA-S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .2 National Building Code 2005 (NBC):
 - .1 NBC 2005, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
- .3 National Fire Code 2005 (NFC):
 - .1 NFC 2005, Division B, Part 2 Emergency Planning, subsection 2.8.2 Fire Safety Plan.
- .4 Province of Ontario:
 - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 Workplace Safety and Insurance Act, 1997.
 - .3 Municipal statutes and authorities.
- .5 Fire Commissioner of Canada (FCC):
 - .1 FC-301 Standard for Construction Operations, June 1982.
 - .2 FC-302 Standard for Welding and Cutting, June 1982.

1.2 SUBMITTALS

- .1 Make submittals in accordance with Section
- .2 Prepare 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.

- .3
 - .1 Results of safety and health risk or hazard analysis for site tasks and operations found in work plan.
 - .2 Measures and controls to be implemented to address identified safety hazards and risks.
 - .3 Prepare a Fire Safety Plan, specific to the work location, in accordance with NBC, Division B, subsection 8.1.1.1 prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Facility's Emergency Procedures and Evacuation Plan in place at the site. Departmental Representative will provide Facility's Emergency Procedures and Evacuation Plan.
 - .4 Contractor's and Sub-contractors' Safety Communication Plan.
 - .5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Facility's Emergency Response requirements and procedures provided by Departmental Representative.

- .4 Submit names of personnel and alternates responsible for site safety and health.

- .5 Submit records of Contractor's Health and Safety meetings when requested.

- .6 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, when requested.

- .7 Submit copies of orders, directions or Reports issued by health and safety inspectors of the authorities having jurisdiction.
 - .8 Submit copies of incident and accident reports.
 - .9 Submit Material Safety Data Sheets (MSDS).
 - .10 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.
- 1.3 FILING OF NOTICE
- .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- 1.4 SAFETY ASSESSMENT
- .1 Perform site specific safety hazard assessment related to project.
- 1.5 REGULATORY REQUIREMENTS
- .1 Comply with the Acts and regulations of the Province of Ontario.
 - .2 Comply with specified standards and regulations to ensure safe operations at site.
 - .3 In event of conflict between any provisions of specified standards and regulations, the most stringent provision governs.
- 1.6 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 either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.7 COMPLIANCE
REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.

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 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.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act for the Province of Ontario.

1.9 UNFORSEEN
HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.

- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

1.10 POSTING OF DOCUMENTS

- .1 Ensure items, articles, notices orders are in conspicuous location site in accordance with Acts and Regulations of Province of Ontario, and incunsultation with Departmental representative.
 - .1 Contractor's Safety Policy
 - .2 Constructors Name
 - .3 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable)
 - .4 Ministry of Labour Orders and reports
 - .5 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario
 - .6 Address and phone number of nearest Ministry of Labour office
 - .7 Material Safety Data Sheets
 - .8 Written emergency Response Plant
 - .9 Site Specific Safety Plan
 - .10 Valid certificate of first aider on duty
 - .11 WSIB "In Case of Injury at Work" poster
 - .12 Location of toilet and cleanup facilities

1.11 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.

1.12 BLASTING .1 Blasting or other use of explosives is not permitted.

1.13 POWDER .1 Use powder actuated devices only after receipt
ACTUATED DEVICES of written permission from Departmental Representative

1.14 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.

.2 Assign responsibility and obligation to Health and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

1.1 REFERENCES AND CODES .1 Perform Work in accordance with National Building Code of Canada (NBC) 2010, National Fire Code of Canada (NFC) 2010 and Ontario Building Code (OBC) 2012, including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply as directed by the Departmental Representative.

- .2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents

1.2 HAZARDOUS MATERIAL DISCOVERY

- .1 Stop work immediately and notify Departmental Representative if materials which may contain designated substances or PCB's, other than those identified in Section 01 35 29 are discovered in course of work.

1.3 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions.

1.10 EXAMINATION

- .1 Examine existing conditions and determine conditions affecting work.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Inspection and testing, administrative and enforcement requirements.
 - .2 Tests and mix designs.
 - .3 Mock-ups.
 - .4 Mill tests.
 - .5 Equipment and system adjust and balance.
- 1.3 INSPECTION
- .1 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.
 - .2 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.
 - .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such work.
 - .4 Departmental Representative may order any 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 under Section 01 29 83, above and beyond those required of the Contractor. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and 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 an orderly sequence so as not to cause delay 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 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Amount difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

1.8 REPORTS

- .1 Submit 1 electronic copy 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 may be requested.
- .2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Departmental Representative and maybe authorized as recoverable.
- 1.10 MOCK-UPS .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.
- .2 Construct in all locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.
- .7 Mock-ups may remain as part of Work.
- 1.11 MILL TESTS .1 Submit mill test certificates as required of specification Sections.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Temporary utilities.
- 1.2 RELATED SECTIONS .1 Section 01 52 00 - Construction Facilities.
.2 Section 01 56 00 - Temporary Barriers and Enclosures.
- 1.4 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00.
- 1.5 INSTALLATION AND REMOVAL .1 Provide temporary utilities controls in order to execute work expeditiously.
.2 Remove from site all such work after use.
- 1.6 DEWATERING .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
- 1.7 WATER SUPPLY .1 Departmental Representative will provide continuous supply of potable water for construction use.
.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.
.3 Departmental Representative will pay for utility charges at prevailing rates.
- 1.8 TEMPORARY HEATING AND VENTILATION .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10°C in areas where construction is in progress.
- .5 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

- .7 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .8 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.9 TEMPORARY POWER AND LIGHT

- .1 Departmental Representative will pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.
- .2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.
- .3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.
- .4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.11 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by [insurance companies having jurisdiction] [and] governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste

materials is not permitted on site.

PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 Construction aids.
- .2 Parking.
- .3 Project identification.

1.2 INSTALLATION
AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

1.3 HOISTING

- .1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Hoists/cranes shall be operated by qualified operator.

1.4 SITE

STORAGE/LOADING

- .1 Refer to CCDC 2, GC
3.12.
- .2 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products.
- .3 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.5 CONSTRUCTION

PARKING

- .1 Parking will be permitted on site provided it does not disrupt performance of Work.
- .2 Provide and maintain adequate access to project site.
- .3 Build and maintain temporary roads where indicated or directed by Departmental Representative and provide snow removal during period of Work.
- .4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
- .5 Clean construction runways and taxi areas where used by Contractor's equipment.

- 1.6 EQUIPMENT,
TOOL AND MATERIALS
STORAGE
- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
 - .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.
- 1.7 CLEAN-UP
- .1 Remove construction debris, waste materials, packaging material from work site daily.
 - .2 Clean dirt or mud tracked onto paved or surfaced roadways.
 - .3 Store materials resulting from demolition activities that are salvageable.
 - .4 Stack stored new or salvaged material.

PART 1 - GENERAL

1.1 SECTION

INCLUDES

- .1 Barriers.
- .2 Environmental Controls.
- .3 Traffic Controls.
- .4 Fire Routes.

1.2 Related

Sections

- .1 Section 01 51 00 - Temporary
- .2 Section 01 52 00 - Construction Facilities.

1.3 REFERENCES

- .1 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
 - .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA):
 - .1 CSA-0121-08, Douglas Fir Plywood.

1.4 INSTALLATION
AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.5 GUARD RAILS AND
BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edge.
- .2 Provide as required by governing authorities.

- 1.6 WEATHER ENCLOSURES
- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
 - .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
 - .3 Design enclosures to withstand wind pressure and snow loading.
- 1.7 DUST TIGHT SCREENS
- .1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
 - .2 Maintain and relocate protection until such work is complete.
- 1.8 ACCESS TO SITE
- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- 1.9 PUBLIC TRAFFIC FLOW
- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform work and protect the public.
- 1.10 FIRE ROUTES
- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.
- 1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY
- .1 Protect surrounding private and public property from damage during performance of Work.
 - .2 Be responsible for damage incurred.

- 1.12 PROTECTION OF BUILDING FINISHES .1 Provide protection for finished and partially finished building finishes and equipment during Performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Product substitution procedures.
- .3 Manufacturer's instructions.
- .4 Quality of Work, coordination and fastenings.
- .5 Existing facilities.

1.2 - RELATED SECTIONS

- .1 Section 01 62 00 - Product Exchange Procedures.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 - TERMINOLOGY

- .1 New: Produced from new materials.
- .2 Re-newed: Produced or rejuvenated from an existing material to like-new condition to serve a new or existing service.
- .3 Defective: A condition determined exclusively by the Consultant.

1.4 - PRODUCT QUALITY

- .1 Products, materials, equipment, parts or assemblies incorporated in Work: New, Renewed, not damaged or defective, of best quality for purpose intended. If requested, provide evidence as to type, source and quality of Products provided.
- .2 Defective Products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.

- .3 Should any dispute arise as to quality or fitness of Products, decision rests strictly with Consultant.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 Permanent labels, trademarks and nameplates on Products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 - AVAILABILITY

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

1.6 - STORAGE AND PROTECTION

- .1 Store and protect Products in accordance with manufacturers' written instructions.
- .2 Store with seals and labels intact and legible.
- .3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.
- .4 For exterior storage of fabricated Products, place on sloped supports above ground.
- .5 Cover Products subject to deterioration with impervious sheet covering. Provide

ventilation to prevent condensation and degradation of Products.

- .6 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- .7 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.7 - TRANSPORTATION AND HANDLING

- .1 Transport and handle Products in accordance with manufacturer's written instructions.
- .2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- .3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.8 - PRODUCT CHANGES

- .1 Change in Product/Products: Submit request for substitution or alternative in accordance with Section 01 62 00.

1.9 - 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 building occupants.
- .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.

1.10 - MANUFACTURERS

WRITTEN INSTRUCTIONS

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

1.11 - 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 Consultant if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site any workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.12 - COORDINATION

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

1.13 - CONCEALMENT

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

1.14 - REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.15 - LOCATION OF
FIXTURES

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

1.16 - 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.

1.17 - 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 Type 304 or 316 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.

1.18 - PROTECTION OF WORK
IN PROGRESS

- .1 Prevent overloading of any part of the Project.
- .2 Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated, without written approval of Consultant.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Substitutions.
- .2 Alternatives.

1.2- RELATED SECTIONS

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 - SUBSTITUTIONS

- .1 Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.
- .2 Consultant will consider requests for Substitutions only within fifteen (15) days after date established in Notice to Proceed of Owner-Contractor Agreement.
- .3 Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.
- .4 Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- .5 A request constitutes a representation that the Contractor:
 - .1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
 - .2 Will provide the same warranty for the Substitution as for the specified Product.
 - .3 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - .4 Waives claims for additional costs or time extension which may subsequently become apparent.
 - .5 Will reimburse Consultant for review or redesign services associated with re-approval by authorities.

- .6 Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- .7 Substitution Submittal Procedure:
 - .1 Submit three (3) copies of request for substitution for consideration. Limit each request to one (1) proposed Substitution.
 - .2 Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.
 - .3 The Consultant will notify Contractor in writing of decision to accept or reject request.

1.4 - ALTERNATIVES

- .1 Accepted Alternatives will be identified in Owner-Contractor Agreement.
- .2 Submit alternatives identifying the effect on adjacent or related components.
- .3 Alternatives quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted alternatives will be identified in the Owner-Contractor Agreement.
- .4 Coordinate related work and modify surrounding work to integrate the Work of each alternative.

PART 1 - GENERAL

- 1.1 SUBMITTALS
- .1 Submittals: in accordance with Section 01 33 00.
 - .2 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of operational elements.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Owner or separate contractor.
 - .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

- 1.2 MATERIALS .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00.
- 1.3 PREPARATION .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.
- 1.4 EXECUTION .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Remove samples of installed Work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .9 Restore work with new products in accordance with requirements of Contract Documents.
- .10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .11 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .12 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Requirements and limitations for cutting and patching of Work.

1.2 - RELATED SECTIONS

- .1 Section 01 61 00 - Product Requirements.
- .2 Section 01 62 00 - Product Exchange Procedures: Product options and substitutions.
- .3 Individual Product Specification Sections:
 - .1 Cutting and patching incidental to work of the section.
 - .2 Advance notification to other sections of openings required in Work of those sections.
 - .3 Limitations on cutting structural members.

1.3 - SUBMITTALS

- .1 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather exposed or moisture resistant element.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight exposed elements.
 - .5 Work of Owner or separate contractor.
- .2 Include in request:
 - .1 Identification of Project.
 - .2 Location and description of affected Work.

- .3 Necessity for cutting or alteration.
- .4 Description of proposed Work and Products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

Part 2 PRODUCTS

2.1 - MATERIALS

- .1 Primary Products: Those required for original installation.
- .2 Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 62 00.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering existing Work, assess conditions affecting performance of work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.

3.2 - PREPARATION

- .1 Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.

- .2 Provide protection from elements for areas which may be exposed by uncovering work.
- .3 Maintain excavations free of water.

3.3 - CUTTING

- .1 Execute cutting and fitting including excavation and fill to complete the Work.
- .2 Uncover work to install improperly sequenced work.
- .3 Remove and replace defective or non-conforming work.
- .4 Remove samples of installed work for testing when requested.
- .5 Provide openings in the Work for penetration of mechanical and electrical work.
- .6 Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- .7 Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

3.4 - PATCHING

- .1 Execute patching to complement adjacent Work.
- .2 Fit Products together to integrate with other Work.
- .3 Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- .4 Employ original installer to perform patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- .5 Restore work with new Products in accordance with requirements of Contract Documents.

- .6 Fit work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .7 Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Progressive cleaning.
- .2 Cleaning prior to acceptance.

1.2 - RELATED SECTIONS

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

Part 2 PRODUCTS

2.1 - CLEANING MATERIALS

- .1 Cleaning Agents and Materials: Low VOC content.

Part 3 EXECUTION

3.1 - PROGRESSIVE CLEANING

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .3 Clear snow and ice from area of construction, bank or pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Containers:
 - .1 Provide on-site steel framed, hinged lid containers for collection of waste materials and debris.
 - .2 Provide and use clearly marked, separate bins for recycling.

- .6 Remove waste material and debris from site and deposit in waste container at end of each working day.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finish 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 enclosure 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.

3.2 - CLEANING PRIOR TO ACCEPTANCE

- .1 Prior to applying for Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.

- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors.
- .9 Clean and polish surface finishes, as recommended by manufacturer.
- .10 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .11 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .12 Remove dirt and other disfiguration from exterior surfaces.
- .13 Sweep and wash clean paved areas.

3.3- FINAL PRODUCT CLEANING

- .1 Execute final cleaning prior to final project assessment. Refer to Section 01 74 00.
- .2 Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
- .3 Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- .4 Clean site; sweep paved areas, rake clean landscaped surfaces.
- .5 Remove waste and surplus materials, rubbish, and construction facilities from the site.

PART 1 - GENERAL

- 1.1 SECTION INCLUDES -
- .1 Progressive cleaning.
 - .2 Final cleaning.
- 1.2 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 regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
 - .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .4 Provide on-site containers for collection of waste materials and debris.
 - .6 Remove waste material and debris from site and deposit in waste container at end of each working day.
 - .7 Dispose of waste materials and debris of site.
 - .8 Clean interior areas prior to start of finish 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.

1.3 FINAL CLEANING-

- .1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .8 Clean equipment and fixtures to a sanitary condition.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

- .5 Operation of systems have
 been demonstrated to Owner's
 personnel.

- .6 Work is complete and ready for Final
 Inspection.

- .4 Final Inspection: when items noted above
 are completed, request final inspection of
 Work by Departmental Representative and
 Contractor. If Work is deemed incomplete
 by Departmental Representative, complete
 outstanding items and request
 reinspection.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 As-built, samples, and specifications.
- .2 Equipment and systems.
- .3 Product data, materials and finishes, and related information.
- .4 Operation and maintenance data.
- .5 Spare parts, special tools and maintenance materials.
- .6 Warranties and bonds.

1.2 SUBMISSION

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned after final inspection, with Departmental Representative's comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of maintenance manuals and commissioning documentation in English.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.

- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.

1.3 FORMAT

- .1 Organize data in the form of an instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings. 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. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on CD or USB drive.

- 1.4 CONTENTS - EACH VOLUME
- .1 Table of Contents: provide title of project;
 - .1 Date of submission; names, addresses, and telephone numbers of Consultant and contractor with name of responsible parties;
 - .2 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 clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- 1.5 CONTENTS-EACH VOLUME
- .1 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
 - .2 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.
- 1.6 AS-BUILTS AND SAMPLES
- .1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
 - .1 Contract Drawings
 - .2 Specifications
 - .3 Amendments
 - .4 Change Orders and other modifications to the Contract
 - .5 Reviewed shop drawings, product data, and samples
 - .6 Field test records
 - .7 Inspection certificates
 - .8 Manufacturer's certificates

- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.
- .6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Consultant on completion of work. Consultant will complete a Record set of drawings for AAFC after all records documents are submitted to the consultant and approved by the Consultant.

1.7 RECORDING
ACTUAL SITE
CONDITIONS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings:
legibly mark each item to record actual construction, including:

- .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications: legibly mark each item to record actual construction, including:
- .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Amendments and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 MATERIALS AND FINISHES

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

- .3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional Requirements: as specified in individual specifications sections.

1.9 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 site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.10 MAINTENANCE MATERIALS

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

1.11 MAINTENANCE MATERIALS

- .1 Obtain receipt for delivered products and submit prior to final payment.

1.12 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 site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

1.13 STORAGE,
HANDLING AND
PROTECTION

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

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Equipment and systems.
- .2 Materials and finishes.
- .3 Spare parts.
- .4 Maintenance manuals.
- .5 Special tools.
- .6 Storage, handling and protection.

1.2 - RELATED SECTIONS

- .1 Section 01 45 00 - Quality Control.
- .2 Section 01 78 40 - Maintenance Requirements.

1.3- 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 Building Envelope: include copies of drawings of building envelope components, illustrating the interface with similar or dissimilar items to provide an effective air, vapour and thermal barrier between indoor and outdoor environments. Include an

outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.

- .5 Additional Requirements: as specified in individual specifications sections.

1.4- MAINTENANCE MATERIALS

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .4 Obtain receipt for delivered products and submit prior to final payment.

1.5 - 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 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

Part 2 EXECUTION

2.1 - DELIVER TO SITE

- .1 Deliver to location as directed; place and store.

2.2 - STORAGE, HANDLING AND PROTECTION

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

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Demolition of designated structures and removal of materials from site.
- .2 Demolition and removal of foundations and slabs-on-grade.

1.2- ADMINISTRATIVE

REQUIREMENTS

- .1 Scheduling:
 - .1 Schedule Work to coincide with site excavation work.
 - .2 Describe demolition removal procedures and schedule.

1.3- SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate demolition; location and construction of temporary work.

1.4 - CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Record Documentation: Accurately record actual locations of subsurface obstructions, capped utilities.

1.5- REGULATORY REQUIREMENTS

- .1 Conform to applicable code for demolition of structures, safety of adjacent structures.
- .2 Notify affected utility companies before starting work and comply with their requirements.

- .3 Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

Part 2 PRODUCTS

Part 3 EXECUTION

3.1 - PREPARATION

- .1 Protect existing structures which are not to be demolished.
- .2 Prevent movement or settlement of adjacent structures. Provide bracing and shoring.
- .3 Mark location of utilities.

3.2 - DEMOLITION REQUIREMENTS

- .1 Conduct demolition to minimize interference with adjacent structures.
- .2 Cease operations immediately if adjacent structures appear to be in danger. Notify Consultant Do not resume operations until directed.
- .3 Conduct operations with minimum interference to public or private accesses. Maintain egress and access at all times.

3.3- DEMOLITION

- .1 Remove foundation walls and footings to a minimum of 24 inches below finished grade within area of new construction.
- .2 Remove concrete slabs on grade as indicated on drawings.
- .3 Remove materials to be re-installed or retained in manner to prevent damage. Store and protect in accordance with requirements of Section 01 61 00.
- .4 Remove demolished materials from site.

- .5 Do not burn or bury materials on site.
Leave site in clean condition.
- .6 Remove temporary work.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Formwork for cast-in-place concrete, with shoring, bracing and anchorage.
- .2 Openings in forms for other work.
- .3 Form accessories.
- .4 Form stripping.

1.2 - RELATED SECTIONS

- .1 Section 03 20 00 - Concrete Reinforcing.
- .2 Section 03 30 00 - Cast-in-Place Concrete: Supply of concrete accessories for placement by this section.
- .3 Section 05 50 00 - Metal Fabrications: Supply of metal fabrications for placement by this section.
- .4 Section 07 62 00 - Sheet Metal Flashing and Trim: Supply of flashing reglets for placement by this section.

1.3- REFERENCES

- .1 ACI 301-10 - Specifications for Structural Concrete for Buildings.
- .2 ASME A17.1-2010/CSA-B44-10 - Handbook on Safety Code for Elevators and Escalators.
- .3 CSA-S269.1-1975 (R2003) - Falsework for Construction Purposes.CSA-S269.1-1975 (R2003) - Falsework for Construction Purposes.
- .4 CAN/CSA-S269.3-M92 (R2013) - Concrete Formwork.
- .5 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

- .6 CSA-O121-08 (R2013) - Douglas Fir Plywood.
- .7 CSA-O151-09 - Canadian Softwood Plywood.
- .8 CSA-O153-13 - Poplar Plywood.
- .9 CSA-O437 Series-93 (R2011) - Standards on OSB and Waferboard.
- .10 CSA-S269.1-1975 (R2003) - Falsework for Construction Purposes.CSA-S269.1-1975 (R2003) - Falsework for Construction Purposes.
- .11 COFI (Council of Forest Industries of British Columbia) - Exterior Plywood for Concrete Formwork.

1.4 - DESIGN REQUIREMENTS

- .1 Design, engineer and construct formwork, shoring and bracing to conform to code requirements; resultant concrete to conform to required shape, line and dimension.
- .2 Conform to CSA-S269.1.

1.5- QUALITY ASSURANCE

- .1 Design formwork under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.6 - REGULATORY REQUIREMENTS

- .1 Conform to applicable code for design, fabrication, erection and removal of formwork.

1.7- DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver void forms and installation instructions in manufacturer's packaging.

- .3 Store off ground in ventilated and protected manner to prevent deterioration from moisture.

Part 2 PRODUCTS

2.1 - WOOD FORM MATERIALS

- .1 Form Materials: At the discretion of the Contractor.
- .2 Plywood: CSA-0121, Douglas Fir grade; sound undamaged sheets with clean, true edges.
- .3 Lumber: With grade stamp clearly visible.

2.2- FORMWORK ACCESSORIES

- .1 Form Ties: Removable type, galvanized metal, adjustable free of defects that could leave holes larger than 1 inch in concrete surface.
- .2 Form Release Agent:
 - .1 Colourless mineral oil which will not stain concrete, or absorb moisture.
 - .2 Non-toxic low VOC.
- .3 Form Stripping Agent: Colourless mineral oil, biodegradable..
- .4 Corners: Chamfered; maximum possible lengths.
- .5 Dovetail Anchor Slot: Galvanized steel, 22 gauge thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- .6 Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify lines, levels and centres before proceeding with formwork.
- .3 Ensure that dimensions agree with drawings.

3.2 - EARTH FORMS

- .1 Earth forms are not permitted.
- .2 Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.3 - ERECTION - FORMWORK

- .1 Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of [CAN/CSA-S269.3].
- .2 Fabricate and erect false work in accordance with [CSA-S269.1].
- .3 Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- .4 Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- .5 Align joints and make watertight. Keep form joints to a minimum.
- .6 Obtain approval before framing openings in structural members which are not indicated on Drawings.

3.4- APPLICATION - FORM RELEASE AGENT

- .1 Apply form release agent on formwork in accordance with manufacturer's recommendations.
- .2 Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

- .3 Do not apply form release agent where concrete surfaces will receive which are effected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.5 - INSERTS, EMBEDDED PARTS, AND OPENINGS

- .1 Provide formed openings where required for items to be embedded in passing through concrete work.
- .2 Locate and set in place items which will be cast directly into concrete.
- .3 Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- .4 Install accessories in accordance with manufacturer's written instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- .5 Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- .6 Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.6 - FORM CLEANING

- .1 Clean forms as erection proceeds, to remove foreign matter within forms.
- .2 Clean formed cavities of debris prior to placing concrete.
- .3 Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

- .4 During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.7 - FORMWORK TOLERANCES

- .1 Construct formwork to maintain tolerances in accordance with CSA-A23.1/A23.2.

3.8- FIELD QUALITY CONTROL

- .1 Section 01 45 00: Field testing.
- .2 Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

3.9- FORM REMOVAL

- .1 Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- .2 Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- .3 Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete and steel fiber for fiber-reinforced slab on grade concrete.

1.2 - RELATED SECTIONS

- .1 Section 03 11 00 - Concrete Forming.
- .2 Section 03 30 00 - Cast-in-place Concrete.
- .3 Section 03 35 10 - Concrete Floor Finishing

1.3- REFERENCES

- .1 ASTM A1064/A1064M-13 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .2 ASTM A123/A123M-13 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM A184/A184M-06(2011) - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
- .4 ASTM A1064/A1064M-13 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .5 ASTM A820/A820M-11 standard specification for Steel Fibre for Fibre - Reinforced concrete.
- .6 ASTM A496/A496M-11 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.

- .2 Welded Steel Wire Reinforcement, Plain:
ASTM A1064/A1064M, in flat sheets.

2.2 - ACCESSORIES

- .1 Tie Wire: Minimum 1.65 mm<<16
gauge>>.
- .2 Chairs, Bolsters, Bar Supports,
Spacers: Sized and shaped for strength
and support of reinforcement during
concrete placement conditions
[including load bearing pad on bottom
to prevent vapour barrier puncture].

2.3- FABRICATION

- .1 Fabricate concrete reinforcing in
accordance with:
 - .1 CSA-A23.1/A23.2.
 - .2 RSIC.
- .2 Weld reinforcement to CSA-W186.

Part 3 EXECUTION

3.1 - PLACEMENT

- .1 Place, support and secure reinforcement
against displacement to CSA-
A23.1/A23.2.
- .2 Do not displace or damage vapour
barrier.
- .3 Accommodate placement of formed
openings.
- .4 Maintain concrete cover around
reinforcing as follows:
 - .1 Footings and Concrete Formed
Against Earth 75mm 3 inch.
 - .2 Slabs on Fill 2 mm 50 inch.

3.2- FIELD QUALITY CONTROL

- .1 Inspect for acceptability.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Cast-in-place concrete equipment pads, slabs on grade, foundation walls, footings.
- .2 Control, expansion and contraction joint devices associated with concrete work including embedments and joint sealants.

1.2 - RELATED SECTIONS

- .1 Section 03 11 00 - Concrete Forming: Formwork and accessories.
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 03 35 10 - Concrete Floor Finishing.

1.3- REFERENCES

- .1 ACI 305R-10 - Guide to Hot Weather Concreting.
- .2 ACI 306R-10 - Guide to Cold Weather Concreting.
- .3 ASTM A820/A820M-11 - Standard Specification for Steel Fibers for Fiber-Reinforced Concrete.
- .4 ASTM C260/C260M-10a - Standard Specification for Air-Entraining Admixtures for Concrete.
- .5 ASTM C330/C330M-13 - Standard Specification for Lightweight Aggregates for Structural Concrete.
- .6 ASTM C494/C494M-13 - Standard Specification for Chemical Admixtures for Concrete.
- .7 ASTM C1017/C1017M-07 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

- .8 ASTM D412-06a(2013) - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.
- .9 ASTM D624-00(2012) - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- .10 ASTM D994/D994M-11 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- .11 ASTM D1751-04(2013)e1 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- .12 ASTM D1752-04a(2013) - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .13 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .14 CSA-A3000-13 - Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.4 - SUBMITTALS FOR REVIEW

- .1 Product Data: Provide data on joint devices, attachment accessories, admixtures.
- .2 Concrete: Mix design and supplier information

1.5 - SUBMITTALS FOR INFORMATION

- .1 Provide certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

- .1 Portland cement.
- .2 Blended hydraulic cement.
- .3 Portland-limestone cement.
- .4 Supplementary cementing materials.
- .5 Grout.
- .6 Admixtures.
- .7 Aggregates.
- .8 Water.

- .2 Certification: Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with .

- .3 Certification: Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of.

- .4 Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent Work.

1.6- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Record Documentation: Accurately record actual locations of embedded utilities and components.

1.7- QUALITY ASSURANCE

- .1 Perform Work in accordance with CSA-A23.1/A23.2.
- .2 Maintain one (1) copy of document on site.
- .3 Acquire cement and aggregate from same source for all work.
- .4 Conform to CSA-A23.1/A23.2 when concreting during hot weather.
- .5 Conform to CSA-A23.1/A23.2 when concreting during cold weather.

Part 2 PRODUCTS

2.1 - CONCRETE MATERIALS

- .1 Hydraulic Cement: CSA-A3000
- .2 Blended Hydraulic Cement: CSA-A3000,
- .3 Supplementary Cementing Materials:
CSA-A3000
- .4 Fine Aggregates: Normal density
aggregates, graded to CSA-A23.1/A23.2;
maximum aggregate size 3/8 inch.
- .5 Coarse Aggregates: Normal density
aggregates, graded to CSA-A23.1/A23.2
- .6 Lightweight Aggregate: ASTM
C330/C330M, for structural concrete.
- .7 Water: CSA-A23.1/A23.2, clean and not
detrimental to concrete.

2.2 - ADMIXTURES

- .1 Air Entrainment: ASTM C260/C260M.
- .2 Chemical Admixtures: ASTM C494/C494M

2.3 - ACCESSORIES

- .1 Bonding Agent: Epoxy bonding agent
- .2 Non-Shrink Grout: Premixed compound
consisting of non-metallic aggregate,
cement, water reducing and plasticizing
agents; capable of developing minimum
compressive strength of 2460 psi in 48
hours and 7000 psi in 28 days.

2.4- JOINT DEVICES AND FILLER MATERIALS

- .1 Joint Filler Type A: asphalt
impregnated fibreboard or felt, 1/4
inch thick; tongue and groove profile.
- .2 Construction Joint Devices
- .3 Ribbed Water Stops: Extruded PVC,
Arctic Grade
- .4 Cushion Pads: Tough, resilient,
weather, moisture, and oil resistant

material that will not corrode or cause corrosion, consisting of either layers of approved cotton duck saturated and bound together by rubber or synthetic compounds or made from specially compounded synthetic materials.

- .5 Contraction Expansion Joint Devices: ASTM B221M alloy, extruded aluminum; resilient elastomeric vinyl filler strip with a Shore A hardness of 80 to permit plus or minus 25% joint movement with full recovery
- .6 Sealant: ASTM C920

2.5 - CONCRETE MIX

- .1 Mix and deliver normal density concrete in accordance with CSA-A23.1/A23.2
- .2 Use accelerating admixtures in cold weather only when approved by Consultant. Use of admixtures will not relax cold weather placement requirements.
- .3 Use calcium chloride only when approved by Consultant.
- .4 Use set retarding admixtures during hot weather only when approved by Consultant.
- .5 Add air entraining agent to normal weight concrete mix for work exposed to exterior.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify all dimensions and locations required on drawings.
- .3 Verify requirements for concrete cover over reinforcement.

- .4 Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not impede concrete placement.
- .5 Verify locations of all openings and embedments required for other mechanical electrical architectural structural work.

3.2 - PREPARATION

- .1 Prepare previously placed concrete by cleaning with steel brush and applying bonding agent to manufacturer's written instructions.
- .2 In locations where new concrete is dowelled to existing work, drill holes in existing concrete size as shown. Insert steel dowels and pack solid with non-shrink grout.
- .3 Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.3 - PLACING CONCRETE

- .1 Place concrete in accordance with CSA-A23.1/A23.2.
- .2 Notify Consultant minimum twenty-four (24) hours prior to commencement of operations.
- .3 Ensure reinforcement, embedded parts are not disturbed during concrete placement.
- .4 Install vapour retarder under interior slabs on grade. Lap joints minimum 12 inches and seal watertight.
- .5 Repair vapour retarder damaged during placement of concrete reinforcing. Repair with vapour retarder material; lap over damaged areas minimum 6 inches and seal watertight.

- .6 Water Stops.
 - .1 Install water stops to provide continuous watertight seal.
 - .2 Do not distort or pierce water stop in such a way as to hamper performance.
 - .3 Do not displace reinforcement when installing water stops.
 - .4 Use equipment to manufacturer's requirements to field splice water stops.
 - .5 Tie water stops rigidly in place.
 - .6 Use only straight heat sealed butt joints in field.
 - .7 Use factory welded corners and intersections.
- .7 Separate slabs on grade from vertical surfaces with 12 mm ½ inch thick joint filler.
- .8 Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- .9 Extend joint filler from bottom of slab to within 1/4 inch of finished slab surface.
- .10 Install joint devices to manufacturer's written instructions.
- .11 Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- .12 Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- .13 Place concrete continuously between predetermined expansion, control, and construction joints.

- .14 Do not interrupt successive placement; do not permit cold joints to occur.
- .15 Saw cut joints within twenty-four (24) hours after placing. 3/16 inch thick blade, cut minimum 1/4 depth of slab thickness.
- .16 Screed slabs on grade level, maintaining surface flatness to CSA-A23.1/A23.2 of maximum 1/4 inch in 10 ft.

3.4 - SEPARATE FLOOR TOPPINGS

- .1 Place monolithic topping before base course has completely set, to CSA-A23.1/A23.2.
- .2 Prior to placing bonded concrete topping, roughen substrate concrete surface and remove deleterious material to CSA-A23.1/A23.2. Broom and vacuum clean.
- .3 Place required dividers and other items to be cast into concrete.
- .4 Apply concrete topping using epoxy grout procedures to manufacturer's written instructions.
- .5 Place concrete floor toppings to required lines and levels.
- .6 Place concrete floor topping in checkerboard panels, dimension not to exceed 20 ft.

3.5 - TOLERANCES

- .1 Slab and Floor Tolerances: To CSA-A23.1/A23.2

3.6 - CONCRETE FINISHING

- .1 Provide formed concrete surfaces to be left exposed with smooth rubbed finish
- .2 Finish concrete floor surfaces in accordance with CSA-A23.1/A23.2.

3.7- CURING AND PROTECTION

- .1 Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical damage.
- .2 Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- .3 Cure floor surfaces in accordance with CSA-A23.1/A23.2.
- .4 Spraying: Spray water over floor slab areas and maintain wet cure for seven (7) days.

3.8 - FIELD QUALITY CONTROL

- .1 Provide free access to Work and cooperate with appointed firm.
- .2 Submit proposed mix design of each class of concrete to inspection testing firm for review prior to commencement of Work.
- .3 Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
- .4 Three (3) concrete test cylinders will be taken and tested for every <75 cu m><<100 cu yds of each class of concrete placed.
 - .1 Minimum one (1) test per day.
 - .2 One (1) test per type of component [slabs].
- .5 One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.
- .6 One slump or flow test and one air test will be taken for each set of test cylinders.

3.9 - PATCHING

- .1 Allow Consultant to inspect concrete surfaces immediately upon removal of forms.
- .2 Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Consultant upon discovery.
- .3 Patch imperfections in accordance with CSA-23.1.

3.10 - DEFECTIVE CONCRETE

- .1 Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- .2 Repair or replacement of defective concrete will be determined by the Consultant.
- .3 Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Consultant for each individual area.

3.11 - SCHEDULE - CONCRETE TYPES AND FINISHES

- .1 Foundations: 30 MPa - 28 day concrete
- .2 Slab on Grade interior 25 MPa -28 day concrete.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Finishing slabs-on-grade separate.
- .2 Surface treatment with sealer.

1.2 - RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-place Concrete: control and formed expansion and contraction joints and joint devices, Prepared concrete floors ready to receive finish.
- .2 Section 07 92 00 - Joint Sealants.

1.3- REFERENCES

- .1 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 ACI 302.1R-04 - Guide for Concrete Floor and Slab Construction.

Part 2 PRODUCTS

2.1 - COMPOUNDS - HARDENERS AND SEALERS

- .1 Product: Florseal WB 18, manufactured by Sika.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify that floor surfaces are acceptable to receive the work of this section.

3.2 - FLOOR FINISHING

- .1 Finish concrete floor surfaces to CSA-A23.1/A23.2.

- .2 Steel trowel surfaces which are scheduled to be exposed.
- .3 In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains as indicated on Drawings at nominal 10 mm per m 1/8 inch per ft

3.3 - FLOOR SURFACE TREATMENT

- .1 New floor slab surface finish to match existing condition.
-

Part 1 GENERAL

- SECTION INCLUDES

- .1 Shop fabricated miscellaneous metal items.

- RELATED SECTIONS

- .2 Section 03 30 00 - Cast-in-place Concrete: Placement of metal fabrications in concrete.
- .3 Section 05 12 00 - Structural Steel: Structural steel column anchor bolts.
- .4 Section 05 51 00 - Metal Stairs.
- .5 Section 05 52 00 - Metal Railings.
- .6 Section 09 91 10 - Painting: Paint finish.

- REFERENCES

- .7 AAMA 2603-13 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels..
- .8 AAMA 2604-13 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
- .9 AAMA 2605-13 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- .10 ASTM A53/A53M-12 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

- .11 ASTM A153/A153M-09 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .12 ASTM A307-12 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .13 ASTM A500/A500M-13 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- .14 ASTM A501-07 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- .15 ASTM B177/B177M-11 - Standard Guide for Engineering Chromium Electroplating.
- .16 ASTM B209M-10 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .17 ASTM B209-10 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .18 ASTM B210M-12 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
- .19 ASTM B210-12 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
- .20 ASTM B211M-12e1 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- .21 ASTM B211-12e1 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- .22 ASTM B221M-13 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .23 ASTM B221-13 - Standard Specification for Aluminum and Aluminum-Alloy

Extruded Bars, Rods, Wire, Profiles,
and Tubes.

- .24 CSA-G40.20-13/G40.21-13 - General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel.
- .25 CSA-W47.1-09 - Certification of Companies for Fusion Welding of Steel.
- .26 CSA-W47.2-11 - Certification of Companies for Fusion Welding of Aluminum.
- .27 CSA-W48-14 - Filler Metals and Allied Materials for Metal Arc Welding.
- .28 CSA-W55.3-08 (R2013) - Certification of Companies for Resistance Welding of Steel and Aluminum.
- .29 CSA-W59-13 - Welded Steel Construction (Metal Arc Welding).
- .30 CSA-W59.2-M1991 (R2013) - Welded Aluminum Construction.
- .31 MPI (Master Painters Institute) - Architectural Painting Specifications Manual and Maintenance Repainting Manual.
- .32 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

- SUBMITTALS FOR REVIEW

- .33 Section 01 33 00: Submission procedures.
- .34 Shop Drawings:
 - .1 Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

- .2 Indicate welded connections using standard welding symbols. Indicate net weld lengths.
- SUBMITTALS FOR INFORMATION
- .35 Section 01 33 00: Submission procedures.
- CLOSEOUT SUBMITTALS
- .36 Section 01 78 10: Submission procedures.
- QUALITY ASSURANCE
- .37 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .38 Welders' Certificates: Submit to Section 01 33 00 requirements, certifying welders employed on the Work, verifying qualification within the previous twelve (12) months to CSA-W47.1 (steel) CSA-W47.2 (aluminum) CSA-W55.3.
- .39 Welded Steel Construction: CSA-W59.
- .40 Welded Aluminum Construction: CSA-W59.2.
- .41 Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

Part 2 PRODUCTS

- MATERIALS - STEEL
- .1 Steel Sections and Plates: CSA-G40.20/G40.21], Grade 300W.
- .2 Steel Pipe: ASTM A53/A53M], Grade A, Schedule 40, standard weight galvanized finish.
- .3 Steel Tubing: ASTM A501, Grade B, galvanized finish.

- .4 Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153/A153M for galvanized components.
- .5 Welding Materials: Type required for materials being welded.
- .6 Welding Filler Material: CSA-W48.
- .7 Shop and Touch-Up Primer: SPCC-Paint 15, zinc oxide, alkyd.
- .8 Primer: As specified in Section 09 91 10.
- .9 Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic zinc-rich primer.

- MATERIALS - ALUMINUM

- .1 Extruded Aluminum: ASTM B221, alloy 6063, Temper T5.
- .2 Sheet Aluminum: ASTM B209, Alloy.
- .3 Aluminum-Alloy Drawn Seamless Tubes: ASTM B210, Alloy 6063, Temper [T6].
- .4 Aluminum-Alloy Bars: ASTM B211, Alloy 6063, Temper T6.
- .5 Bolts, Nuts, and Washers: Steel, galvanized to ASTM A153/A153M.
- .6 Welding Materials: Type required for materials being welded.

- FABRICATION

- .10 Fit and shop assemble items in largest practical sections, for delivery to site.
- .11 Fabricate items with joints tightly fitted and secured.
- .12 Continuously seal joined members by continuous welds.
- .13 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

.14 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

.15 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

- FABRICATION TOLERANCES

.1 Squareness: 1/8 inch maximum difference in diagonal measurements.

.2 Maximum Offset Between Faces: 1/16 inch.

.3 Maximum Misalignment of Adjacent Members: 1/16 inch.

.4 Maximum Bow: 1/8 inch in 4 ft.

.5 Maximum Deviation From Plane: 1/16 inch in 4 ft.

- FINISHES - STEEL

.16 Prepare surfaces to be primed in accordance with SPCC SP 2.

.17 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

.18 Do not prime surfaces in direct contact with concrete or where field welding is required.

.19 Prime paint items with one (1) coat

.20 Structural Steel Members: Galvanize after fabrication ASTM A123/A123M, with zinc coating thickness [appropriate grade for type and size of steel material indicated 2.0 oz/sq ft.

.21 Non-structural Items: Galvanized after fabrication to ASTM A123/A123M, with zinc coating thickness appropriate grade for type and size of steel material indicated.

- EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field conditions are acceptable and are ready to receive work.
- .3 Verify dimensions, tolerances, and method of attachment with other work.

- PREPARATION

- .2 Clean and strip primed steel items to bare metal where site welding is required.
- .3 Supply steel items required to be cast into concrete with setting templates to appropriate sections.

- INSTALLATION

- .4 Install items plumb and level, accurately fitted, free from distortion or defects.
- .5 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .6 Field weld components indicated on Shop Drawings.
- .7 Perform field welding to CSA requirements.
- .8 Obtain approval prior to site cutting or making adjustments not scheduled.
- .9 After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

- ERECTION TOLERANCES

- .10 Section 01 73 00: Tolerances.

- .11 Maximum Variation From Plumb: 1/4 inch
per story, non-cumulative.
- .12 Maximum Offset From True Alignment: 1/4
inch
- .13 Maximum Out-of-Position: 1/4 inch.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Steel stair frame of structural sections, with open risers.

1.2- RELATED SECTIONS

- .1 Section 05 12 00 - Structural Steel
05 50 00 - Metal Fabrications:
 - .1 Bearing plates angles for metal stairs, including anchorage.
 - .2 Placement of metal anchors in concrete.
- .2 Section 05 52 00 - Metal Railings:
Handrails and balusters other than specified in this section.
- .3 Section 09 91 10 - Painting: Paint finish.

1.3- REFERENCES

- .1 ASTM A53/A53M-12 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- .2 ASTM A123/A123M-13 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM A153/A153M-09 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .4 ASTM A307-12 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .5 ASTM A501-07 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

- .6 ASTM A653/A653M-13 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .7 CSA-G40.20-13/G40.21-13 - General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel.
- .8 CSA-W47.1-09 - Certification of Companies for Fusion Welding of Steel.
- .9 CSA-W47.2-11 - Certification of Companies for Fusion Welding of Aluminum.
- .10 CSA-W48-14 - Filler Metals and Allied Materials for Metal Arc Welding.
- .11 CSA-W55.3-08 (R2013) - Certification of Companies for Resistance Welding of Steel and Aluminum.
- .12 CSA-W59-13 - Welded Steel Construction (Metal Arc Welding).
- .13 MPI (Master Painters Institute) - Architectural Painting Specifications Manual and Maintenance Repainting Manual.
- .14 NAAMM AMP 510-92 - Metal Stairs Manual.
- .15 NAAMM MBG 531-09 - Metal Bar Grating Manual.
- .16 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

1.4 - PERFORMANCE REQUIREMENTS

- .1 Fabricate stair assembly to support a uniform live load of 100 lb/sq ft and a concentrated load of 300 lb/sq ft with deflection of stringer or landing framing not to 1/240 of span.
- .2 Railing assembly, wall rails, and attachments to resist lateral force of

75 lbs at any point without damage or permanent set.

1.5- SUBMITTALS FOR REVIEW

- .1 Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
- .2 Indicate welded connections using standard welding symbols. Indicate net weld lengths.
- .3 Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

Part 2 PRODUCTS

2.1 - MATERIALS

- .1 Steel Sections and Plates: CSA-G40.20/G40.21, Grade 350W.
- .2 Steel Tubing: - CSA - G40 .21 Grade 350W U.NO.
- .3 Bolts, Nuts and Washers: ASTM A325M bolts.
- .4 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; consistent with design of stair structure.
- .5 Welding Materials: Type required for materials being welded.
- .6 Shop and Touch-Up Primer
- .7 Anchor bolts - to ASTM A36

2.2 - COMPONENTS

- .1 Gratings:
 - .1 Steel welded with abrasive checkered plate corrugated nosing's. Steel welded grating with minimum 1 1/4" by 3/16"

bearing bars spaces on 1 3/16"
centre to centre.

2.3- FABRICATION - GENERAL

- .1 Fit and shop assemble components in largest practical sections, for delivery to site.
- .2 Fabricate components with joints tightly fitted and secured.
- .3 Continuously seal joined pieces by continuous welds.
- .4 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- .5 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- .6 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- .7 Accurately form components required for anchorage of stairs landings, railings to each other and to building structure.

2.4- FABRICATION - OPEN GRATING STAIRS AND LANDINGS.

- .1 Fabricate treads 1 1/4 inch thick of welded steel bars, welded to supports;
- .2 Form stringers with rolled steel channels, prime paint finish.
- .3 Form landings 1/1/4 inch thick same as treads; galvanized finish. Reinforce underside with angles to attain design load requirements.

- .4 Form railings with 1 1/2 inch size diameter steel sections, welded to stringers; prime paint finish.

2.5- FINISHES

- .1 Prepare surfaces to be primed
- .2 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- .3 Do not prime surfaces in direct contact with concrete or where field welding is required.
- .4 Prime paint items with one (1) coat.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field conditions are acceptable and are ready to receive work.

3.2 - PREPARATION

- .1 Clean and strip primed steel items to bare metal where site welding is required.
- .2 Supply items required to be cast into concrete with setting templates.

3.3 - INSTALLATION

- .1 Install components plumb and level, accurately fitted, free from distortion or defects to manufacturer's written instructions].
- .2 Provide anchors, hangers struts plates angles required for connecting stairs to structure.
- .3 Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until

- completion of erection and installation of permanent attachments.
- .4 Field weld components indicated on Shop Drawings. Perform field welding in accordance with CSA-W59.
 - .5 Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
 - .6 Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.
 - .7 Obtain approval prior to site cutting or creating adjustments not scheduled.
 - .8 After erection, prime welds, abrasions, and surfaces not galvanized shop primed, except surfaces to be in contact with concrete.

3.4 - ERECTION TOLERANCES

- .1 Maximum Offset From True Alignment:
1/4 inch.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Handrails, balusters, and fittings.

1.2- RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-place Concrete: Placement of anchors in concrete.
- .2 Section 05 50 00 - Metal Fabrications: Attachment angles, plates for metal stairs, including anchorage.
- .3 Section 05 51 00 - Metal Stairs: Handrails other than those specified in this section.
- .4 Section 09 91 10 - Painting: Paint finish.

1.3 - REFERENCES

- .1 ASTM A53/A53M-12 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- .2 ASTM A123/A123M-13 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM A269-13 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .4 ASTM A500/A500M-13 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- .5 ASTM A501-07 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

- .6 ASTM B177/B177M-11 - Standard Guide for Engineering Chromium Electroplating.
- .7 ASTM B211M-12e1 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- .8 ASTM B211-12e1 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- .9 ASTM B221M-13 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .10 ASTM B221-13 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .11 ASTM B241/B241M-12e1 - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
- .12 ASTM B483/B483M-13 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Tube and Pipe for General Purpose Applications.
- .13 CSA-W59-13 - Welded Steel Construction (Metal Arc Welding).
- .14 CSA-W59.2-M1991 (R2013) - Welded Aluminum Construction.
- .15 MPI (Master Painters Institute) - Architectural Painting Specifications Manual and Maintenance Repainting Manual.
- .16 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

1.4 - PERFORMANCE REQUIREMENTS

- .1 Railing assembly, wall rails, and attachments to resist lateral force of 75 lbs at any point without damage or permanent set.

- .2 Fabricate railing assembly, wall rails, and attachments to applicable code requirements.

1.5 - SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

1.6- SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

1.7- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.8- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform welding to CSA-W59.2.

Part 2 PRODUCTS

2.1- ALUMINUM RAILING SYSTEM

- .1 Rails: ASTM B483/B483M extruded tubing, alloy and temper; size as indicated on Drawings.
- .2 Posts: ASTM B483/B483M alloy and temper; size as indicated on Drawings.
- .3 Fittings: Elbows, T-shapes, wall brackets, escutcheons; machined aluminum.
- .4 Mounting: Brackets and flanges, with aluminum inserts for casting in concrete Splice Connectors: Collar with locking set screws aluminum.

- .5 Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

2.2 - STEEL RAILING SYSTEM

- .1 Steel Tubing: ASTM A501.
- .2 Steel Pipe: ASTM A53/A53M.
- .3 Stainless Steel Tubing: ASTM A269, Grade TP 304, welded with No. 4 finish.
- .4 Fittings: Elbows, T-shapes, wall brackets, escutcheons; machined steel.
- .5 Mounting: Adjustable brackets and flanges, with steel inserts for casting in concrete.
- .6 Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
- .7 Splice Connectors: Steel threaded collars.
- .8 Galvanizing: Hot-dip galvanized to ASTM A123/A123M, zinc coating thickness appropriate grade for type and size of steel material indicated.
- .9 Shop and Touch-Up Primer for Steel Components: SPCC-Paint 25, zinc oxide alkyd primer.
- .10 Touch-Up Primer for Galvanized Steel Surfaces: MPI #19, organic.
- .11 Shop Prefinishing: Epoxy coated; colour to match existing stair colours Bldg 55

2.3- FABRICATION

- .1 Fit and shop assemble components in largest practical sizes for delivery to site.
- .2 Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

- .3 Provide anchors, plates required for connecting railings to structure.
- .4 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- .5 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- .6 Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
- .7 Interior Components: Continuously seal joined pieces by continuous welds.
- .8 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- .9 Accurately form components to suit stairs and landings to each other and to building structure.
- .10 Accommodate for expansion and contraction of members and building movement without damage to connections or members.

2.4- FINISHES

- .1 Clear Anodic Coating: AAMA 611.
 - .1 Location: Exterior exposed aluminum surfaces.
- .2 Colour Anodic Coating: AAMA 611.
 - .1 Colour: to match existing
 - .2 Location: Exterior exposed aluminum surfaces.

- .3 Apply one (1) coat of bituminous paint to concealed metal surfaces in contact with cementitious or dissimilar materials.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field conditions are acceptable and are ready to receive work.

3.2 - PREPARATION

- .1 Clean and strip primed steel items to bare metal where site welding is required.
- .2 Supply items required to be cast into concrete with setting templates, to appropriate sections.

3.3 - INSTALLATION

- .1 Install railings to manufacturer's instructions.
- .2 Install components plumb and level, accurately fitted, free from distortion or defects.
- .3 Anchor railings to structure with anchors, plates. Field weld anchors as indicated on Shop Drawings. Touch-up welds with primer. Grind welds smooth.
- .4 Assemble with spigots and sleeves to accommodate tight joints and secure installation.

3.4 - ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation From Plumb: 1/4 inch per storey, non-cumulative.

- .3 Maximum Offset From True Alignment:
1/4 inch.
- .4 Maximum Out-of-Position: 1/4 inch.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Formed stair tread gratings.
- .2 Flat surface stair tread, floor plating.
- .3 Perimeter closure.

1.2 - RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete: Framed concrete opening.
- .2 Section 05 12 00 - Structural Steel 055000 - Metal Fabrications: Framed steel opening.
- .3 Section 05 51 00 - Metal Stairs: Framing for stair treads, grating.
- .4 Section 09 91 10 - Painting: Field paint finish.

1.3 - REFERENCES

- .1 ASTM A123/A123M-13 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A167-99(2009) - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .3 ASTM A510/A510M-13 Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel.
- .4 ASTM A653/A653M-13 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .5 ASTM A666-10 - Standard Specification for Annealed or Cold-Worked Austenitic

- Stainless Steel Sheet, Strip, Plate,
and Flat Bar.
- .6 ASTM A1011/A1011M-13 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
 - .7 ASTM B210-12 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
 - .8 ASTM B210-12 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
 - .9 ASTM B221-13 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .10 ASTM B221M-13 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .11 ASTM E84-13a - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .12 CSA-W47.1-09 - Certification of Companies for Fusion Welding of Steel.
 - .13 CSA-W47.2-11 - Certification of Companies for Fusion Welding of Aluminum.
 - .14 CSA-W48-14 - Filler Metals and Allied Materials for Metal Arc Welding.
 - .15 CSA-W59-13 - Welded Steel Construction (Metal Arc Welding).
 - .16 CSA-W59.2-M1991 (R2013) - Welded Aluminum Construction.
 - .17 MPI (Master Painters Institute) - Architectural Painting Specifications Manual and Maintenance Repainting Manual.

- .18 NAAMM MBG 531-09 - Metal Bar Grating Manual.
- .19 NAAMM MBG 532-09 - Heavy Duty Metal Bar Grating Manual.
- .20 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

1.4 - PERFORMANCE REQUIREMENTS

- .1 Conform to applicable code for applicable loads.
- .2 Load Design: NAAMM MBG 531.
- .3 Design Live Pedestrian Load: Uniform load of 100 lb/sq ft minimum; concentrated load of 300 lb force.
- .4 Maximum Allowable Deflection Under Live Load: 1/240 of span; size components for double span.
- .5 Maximum Spacing Between Bars: To restrict pedestrian shoe heels 3/8 inch.

1.5 - ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.

1.6- SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide span and deflection tables.
- .3 Shop Drawings:
 - .1 Indicate details of plates, gratings, component supports, openings, anchorage, perimeter

construction details, and tolerances.

- .2 Indicate welded connections using standard welding symbols.
Indicate net weld lengths.
- .4 Samples: Submit two (2) samples, 12 inchx12inch in size illustrating surface finish, colour, and texture.

1.7 - SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

1.8- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.9- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Welders' Certificates: Submit to Section 01 33 00, certifying welders employed on the Work, verifying qualification within the previous 12 months to CSA-W47.1 (steel) CSA-W55.3, CSA-W59 CSA-W47.2 (aluminum).

Part 2 PRODUCTS

2.1- MATERIALS

- .1 Sheet Steel : ASTM A167 stainless steel]; with raised lug pattern.
- .2 Formed Steel for Welding:
 - .1 Bearing, connecting and cross bars to ASTM A36/A36M , of rectangular shape.
 - .2 Round cross bars: ASTM A510/A510M.
- .3 Stainless Steel: ASTM A666.
- .4 Welding Materials: Type required for materials being welded.

- .5 Shop and Touch-Up Primer: MPI #76, quick-dry alkyd primer.
- .6 Touch-Up Primer for Galvanized Surfaces: SPCC-Paint 20, Type I inorganic.

2.2- FABRICATION

- .1 Grating Type: NAAMM MBG 531, welded type.
- .2 Fabricate grates to sizes indicated.
- .3 Weld joints of intersecting metal sections.
- .4 Fabricate support framing for openings.
- .5 Top Surface: Non-slip to match existing exterior stair at bldg 55.

2.3- FINISHES

- .1 Prepare surfaces to be primed in accordance with SPCC SP 2.
- .2 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- .3 Do not prime surfaces in direct contact with concrete or where field welding is required.
- .4 Prime paint items with one (1) coat.
- .5 Galvanizing: ASTM A653/A653M, to zinc coating designation.
- .6 Galvanizing: ASTM A123/A123M, appropriate grade for type and size of steel material indicated.
- .7 Aluminum: Mill finish.
- .8 Stainless Steel: No. 316 finish.
- .9 Non-slip Surfacing: Aluminum oxide.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that opening sizes and dimensional tolerances are acceptable.
- .3 Verify that anchors are correctly positioned.

3.2 - INSTALLATION

- .1 Install components to manufacturer's written instructions.
- .2 Place frames in correct position, plumb and level.
- .3 Mechanically cut galvanized finish surfaces. Do not flame cut.
- .4 Set perimeter closure flush with top of grating and surrounding construction.
- .5 Secure to prevent movement.

3.3 - ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Conform to limits specified in NAAMM MBG 531.

3.4- CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Clean welds and damaged coatings and apply one (1) coats of touch-up primer.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 American National Standards Institute /
National Particleboard Association
(ANSI/NPA)
 - .1 ANSI/NPA A208.1-[2009], Particleboard.

- .2 ASTM International
 - .1 ASTM A123-12/A123M-13, Standard
Specification for Zinc (Hot-Dip
Galvanized) Coatings on Iron and Steel
Products.
 - .2 ASTM A653/A653M-13, Standard
Specification for Steel Sheet, Zinc-
Coated (Galvanized) or Zinc-Iron Alloy-
Coated (Galvanealed) by the Hot-Dip
Process.
 - .3 ASTM C578-11b e1, Standard Specification
for Rigid, Cellular Polystyrene Thermal
Insulation.
 - .4 ASTM C1289-11a, Standard Specification
for Faced Rigid Cellular Polyisocyanurate
Thermal Insulation Board.
 - .5 ASTM C1396/C1396M-11, Standard
Specification for Gypsum Board.
 - .6 ASTM D1761-[06], Standard Test Methods
for Mechanical Fasteners in Wood.

- .3
 - .1 ASTM D5055-11a, Standard Specification for
Establishing and Monitoring Structural
Capacities of Prefabricated Wood I-
Joists.
 - .2 ASTM D5456-11a, Standard Specification
for Evaluation of Structural Composite
Lumber Products.
 - .3 American Wood Protection Association
(AWPA):
 - .1 AWPA P5-10, Standard for
Waterborne Preservatives.
 - .4 AWPA P8-11, Standard for Oil-Borne
Preservatives.

- .4 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M(1984), Sealing Compound, One Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1).
 - .2 CAN/CGSB-11.3-M87, Hardboard.
 - .3 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
 - .4 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction and amendment.
 - .5 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.

- .5 CSA International
 - .1 CAN/CSA-A123.2-[03(R2008)], Asphalt Coated Roofing Sheets.
 - .2 CAN/CSA-A247-[M86(R1996)], Insulating Fiberboard.
 - .3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .4 CSA O80 Series-08(R2012), Wood Preservation, Includes Update No. 1 (2008).
 - .5 CAN/CSA-O86-09 Consolidation, Engineering Design in Wood.
 - .6 CSA O112 Series-[M1977(R2006)], CSA Standards for Wood Adhesives.
 - .7 CSA O121-[08], Douglas Fir Plywood.
 - .8 CAN/CSA-O122-06(R2011), Structural Glued-Laminated Timber.
 - .9 CSA O141-[05(R2009)], Softwood Lumber.
 - .10 CSA O151-[09], Canadian Softwood Plywood.

- .11 CSA O153-[M1980(R2008)], Poplar Plywood.
 - .12 CSA O325-[07], Construction Sheathing.
 - .13 CSA O437 Series-93(R2011), Standards on OSB and Waferboard.
 - .14 CAN/CSA-Z809-08, Sustainable Forest Management.
- .6 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.
 - .7 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber December 1, 2010.
 - .8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-[A2007], Architectural Coatings.
 - .2 SCAQMD Rule 1168-[A2005], Adhesives and sealants Applications.
 - .9 Sustainable Forestry Initiative (SFI).
 - .10 The Truss Plate Institute of Canada
 - .1 Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses [2007].
 - .11 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S706-[09], Standard for Wood Fibre Insulating Boards for Buildings.

- 1.2 QUALITY
ASSURANCE
- .1 Lumber by grade stamp of an agency certified by by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.
- 1.3 DELIVERY,
STORAGE AND
HANDLING
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
- .1 Store materials off ground 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 FRAMING
- .1 Description Sustainability Characteristics: STRUCTURAL AND
- .1 Lumber, Finger Jointed Lumber, MATERIALS Glulam, I-Joists, Trusses, SCL, CAN/CSA-Z809, SFI or Forestry Stewardship Council (FSC) Certified.
- .2 Plywood, Particleboard, OSB, urea-formaldehyde free, CAN/CSA-Z809, SFI or Forestry Stewardship Council

(FSC) certified.

- .3 Lumber: softwood, S4S, moisture content S-DRY STRUCTURAL AND graded and stamped in accordance with following PANEL MATERIALS standards:
 - .1 CSA 0141.
 - .1 NLGA Standard Grading Rules for Canadian Lumber.
 - .2 Glued end-jointed (finger-jointed) lumber NLGA Special Products Standard SPS.
 - .3 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-0122.
 - .4 Framing and board lumber: in accordance with NBC, except as follows:
 - .1 Studs: spruce, pine or fir (SPF), 121c. "STUD".
 - .2 Joists, lintels, beams, plates, : spruce, pine or fir (SPF), 124b. "No. 1" STRUCTURAL, STRUCTURAL LIGHT FRAMING AND STRUCTURAL JOISTS AND PLANKS.
 - .4 Plywood, OSB and wood based composite panels: to CSA 0325.
 - .5 Douglas fir plywood: to CSA 0121, urea formaldehyde free.
 - .1 Subfloor: SHG Sheathing Grade. Nominal thickness 22 mm., clean and sized surfaces, T&G edge.

2.2 ACCESSORIES

- .1 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.
- .2 Joist hangers: as per design drawings.
- .3 Fastener Finishes:
 - .1 Galvanizing: to ASTM A123/A123M use galvanized fasteners for exterior work.
- .4 Wood Preservative:
 - .1 Preservative: in accordance with manufacturer's recommendations for surface conditions:

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product 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 PREPARATION

- .1 Treat surfaces of material with wood preservative, before installation.

- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.4 INSTALLATION

- .1 Apply dampproof flashing over concrete or masonry on which wood framing bears.
- .2 Apply wood preservative to wood in contact with concrete and masonry.
- .3 Treat surfaces of pressure treated wood and plywood which are cut or bored after pressure treatment with field applied wood preservative.
- .4 Wood frame construction to National Building Code of Canada 2010, Division B, Part 9.
- .5 Install members true to line, levels and elevations, square and plumb to a tolerance of 1:600 and rigidly secure in place.
- .6 Construct continuous members from pieces of longest practical length.
- .7 Install spanning members with "crown-edge" up.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11.
 - .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.

3.6 PROTECTION

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

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Structural floor.
- .2 Floor sheathing.
- .3 Miscellaneous framing and sheathing.
- .4 Simpson strong tie wood connectors

1.2 - RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete.
- .2 Section 05 12 00 - Structural Steel: Prefabricated steel structural supports.
- .3 Section 08 11 13 - Metal Doors and Frames: Door openings to receive wood blocking.

1.3- REFERENCES

- .1 Wood Design Manual 2010 Canadian Wood Council
- .2 CAN/CGSB 11.3-M87 - Hardboard.
- .3 CANPLY (Canadian Plywood Association) - Canadian Plywood Handbook.
- .4 CAN/CSA-080 Series-08 (R2012) - Wood Preservation. CAN/CSA-080 Series-08 (R2012) - Wood Preservation.
- .5 CSA-0151-09 - Canadian Softwood Plywood.
- .6 CSA-0325-07 (R2012) - Construction Sheathing.
- .7 CSA-0437 Series-93 (R2011) - Standards on OSB and Waferboard.
- .8 NPA A208.1-2009 - Particleboard.

- .9 APA (The Engineered Wood Association) - Product Guide Grades and Specifications.
- .10 NLGA (National Lumber Grades Authority) - Standard Grading Rules for Canadian Lumber, 2010 edition.

1.4 - SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

1.5- SUBMITTALS FOR REVIEW

- .1 Submission:
 - .1 Manufacturer's Certificate: Certify that Products meet or exceed [specified requirements].

1.6- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work in accordance with the following agencies:
 - .1 Lumber Grading Agency: Certified by NLGA.
 - .2 Plywood Grading Agency: Certified by CANPLY.
- .3 In lieu of grade stamping exposed to view lumber and plywood, submit manufacturer's certificate certifying that products meet or exceed specified requirements.

1.7- DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.

- .2 Protect materials from warping or other distortion by stacking in vertical position.

Part 2 PRODUCTS

2.1 - LUMBER MATERIALS

- .1 Beam & Joist Framing
 - .1 Species: S-P-F
 - .2 Grade: N1/N2

2.2- SHEATHING MATERIALS

- .1 Plywood Floor Sheathing: CSA-0151 CSA-0121, Structural I - 7/8" thick plywood
- .2 Plywood Wall Sheathing: CSA-0121 CSA-0151, Structural
- .3 Gypsum Wall Sheathing: Moisture resistant Fire resistant, 5/8 inch

2.3 - ACCESSORIES

- .1 Fasteners and Anchors:
 - .1 Screws and Nails: type and size suitable for application.
 - .2 Joist Hangers Structural Framing Connectors: Simpson Strong-tie Wood Connectors sized to suit framing conditions.

Part 3 EXECUTION

3.1 - FRAMING

- .1 Set structural members level and plumb, in correct position.
- .2 Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

- .3 Place horizontal members, crown side up.
- .4 Construct load bearing framing full length without splices.
- .5 Double members at openings over 16 inches wide. Space short studs over and under opening to stud spacing.
- .6 Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists. Frame rigidly into joists.
- .7 Bridge joists framing in excess of 2.3 8 ft span as detailed at mid-span. Fit solid blocking at end of members.

3.2 - SHEATHING

- .1 Secure floor sheathing with longer edge perpendicular to framing members and with ends staggered and sheet ends over bearing.
- .2 Secure wall sheathing with long dimension parallel to wall studs, with ends over firm bearing and staggered.

3.3 - ERECTION TOLERANCES

- .1 Framing Members: 1/4 inch from true position, maximum.
- .2 Surface Flatness of Floor: 1/4 inch in 10 ft maximum, and 1/2 inch in 30 ft maximum.

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Connection hardware.
- .2 Preservative treatment of wood.

1.2 - RELATED SECTIONS

- .1 Section 03 11 00 - Concrete Forming:
Placement of steel support fabrications
to be cast in concrete.
- .2 Section 05 50 00 - Metal Fabrications:
Structural steel connectors.
- .3 Section 06 11 00 - Wood Framing:
Structural dimension lumber framing.
- .4 Section 05 50 00 - Metal Fabrications
05 12 00 - Structural Steel: Steel
support fabrications into masonry.

1.3- REFERENCES

- .1 ASTM A123/A123M-13 - Standard
Specification for Zinc (Hot-Dip
Galvanized) Coatings on Iron and Steel
Products.
- .2 ASTM A153/A153M-09 - Standard
Specification for Zinc Coating (Hot-
Dip) on Iron and Steel Hardware.
- .3 AWS D1.1/D1.1M-2010 - Structural
Welding Code - Steel.
- .4 CAN/CSA-O80 Series-08 (R2012) - Wood
Preservation.
- .5 CSA-O86-09 (Consolidation) -
Engineering design in wood.
- .6 CSA-W47.1-09 - Certification of
Companies for Fusion Welding of Steel.
- .7 CSA-W59-13 - Welded Steel Construction
(Metal Arc Welding).
- .8 CAN/ULC-S102-10 - Standard Method of
Test for Surface Burning

Characteristics of Building Materials and Assemblies.

- .9 CLSAB (Canadian Lumber Standards Accreditation Board) - Grading Rules.
- .10 NLGA (National Lumber Grades Authority) - Standard Grading Rules for Canadian Lumber, 2010 edition.

1.4 - SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Submit data on proprietary connection devices Submit technical data on wood preservative materials.
- .3 Shop Drawings: Indicate dimensions, wood species and grades, component profiles, drilled holes, fasteners, connectors, erection details. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

1.5 - SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including erection sequence.
- .3 Welders Certificates: Certify welders employed on the Work, to CSA-W47.1 within the previous twelve (12) months.

1.6- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.7- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.

- .2 Perform welding Work in accordance with CSA-W59.
- .3 Lumber Grading Agency: NLGA.
- .4 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years experience.
- .5 Pressure Preservative Treated Wood: Marked with certification mark authorized by the Canadian Wood Preservers Bureau (CWPB) indicating producer, preservative type, retention and Use Category (UC).
- .6 Design members under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is located.

Part 2 PRODUCTS

2.1 - MATERIALS

- .1 Lumber Grading Rules: NLGA.

2.2- ACCESSORIES

- .1 Fasteners and Anchors:
 - .1 Bolts, Nuts, Washers, Lags, and Screws: Galvanized steel.
 - .2 Anchors: Galvanized steel ,bolt or ballistic fastener for anchorages to steel expansion shield and lag bolt type for anchorage to solid masonry or concrete, toggle bolt type for anchorage to hollow masonry.
 - .3 Galvanized Coating for Exterior Work: Hot dip galvanized to ASTM A153/A153M.
 - .4 Galvanized Coating for Treated Wood: Hot dip galvanized to ASTM

A153/A153M, Class A or B1 (G185)
zinc coating.

- .2 Connectors and Plates:
 - .1 Connectors: Galvanized steel.
 - .2 Galvanized Coating for Untreated Wood: Hot dip galvanized after fabrication to ASTM A123/A123M.
 - .3 Galvanized Coating for Treated Wood: Hot dip galvanized after fabrication to ASTM A123/A123M.
- .3 Primer: Zinc-rich Primer.

2.3 - FABRICATION

- .1 Fabricate components in accordance with CSA-O86, with joints neatly fitted, welded and ground smooth.

2.4 - FINISHES

- .1 Timber Surfaces Exposed to View: Rough sawn.
- .2 Prime connectors, except where cast in concrete.

2.5 - WOOD TREATMENT

- .1 Wood Preservative (Pressure Treatment): CAN/CSA-O80 Series, and in accordance with Table 2 - Use Categories for Specific Products, Uses, and Exposures
 - .1 UC2: Interior construction, above-ground and potentially damp applications; use inorganic boron (SBX) preservative.
 - .2 UC3.1: Exterior construction, protected, above-ground applications; use waterborne acid-based, type CCA.
- .2 Wood Preservative (Surface Application): copper naphthenate.

Part 3 EXECUTION

3.1 - ERECTION

- .1 Set structural members level and plumb, in correct position.
- .2 Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- .3 Do not field cut or alter structural members without approval of Consultant.
- .4 After erection, touch-up galvanized surfaces with primer consistent with shop coat.

3.2 - SITE APPLIED WOOD TREATMENT

- .1 Apply preservative treatment to manufacturer's written instructions.
- .2 Brush apply two (2) coats of preservative treatment on wood requiring cutting or drilling after treatment [and on wood in contact with cementitious materials.
- .3 Allow preservative to cure prior to erecting members.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Board insulation underside of floor slabs.

1.2- REFERENCES

- .1 ASTM C208-12 - Standard Specification for Cellulosic Fiber Insulating Board.
- .2 ASTM C552-13 - Standard Specification for Cellular Glass Thermal Insulation.
- .3 ASTM C578-13 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- .4 ASTM C612-10 - Standard Specification for Mineral Fiber Block and Board Insulation.
- .5 ASTM C1126-13a - Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
- .6 ASTM C1289-14 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .7 ASTM E84-13a - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .8 ASTM E96/E96M-13 - Standard Test Methods for Water Vapor Transmission of Materials.
- .9 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3- SYSTEM DESCRIPTION

- .1 Materials of This Section: Provide thermal protection to vapour retarder

in conjunction with vapour retarder
materials in Section 07 26 00.

1.4- ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.

1.5- SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on product characteristics, performance criteria, limitations.

1.6 - SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Indicate special environmental conditions required for installation, installation techniques,.
- .3 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.7- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.8- ENVIRONMENTAL REQUIREMENTS

- .1 Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

Part 2 PRODUCTS

2.1 - MANUFACTURERS - INSULATION MATERIALS

- .1 Product: Owens Corning

- .2 High Density Extruded Polystyrene Rigid Insulation
- .3 Substitutions: Refer to Section 01 62 00.

2.2 - INSULATION MATERIALS

- .1 Extruded Polystyrene Insulation (XPS): CAN/ULC-S701, Type 4; cellular type, conforming to the following:
 - .1 Compressive Strength: 210 kPa.
 - .2 Thermal Resistance: R-5.0 at 75Deg F
 - .3 Water Absorption: .7% by volume maximum.
 - .4 Board Thickness: 2 inches.
 - .5 Board Edges: Shiplapped
 - .6 Flame/Smoke Properties: to CAN/ULC-S102.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify that substrate, adjacent materials, and insulation boards are dry and ready to receive insulation. Verify substrate surface is flat, free of irregularities.

3.2- INSTALLATION - UNDER CONCRETE SLABS

- .1 Place insulation under slabs on grade after base for slab has been compacted.
- .2 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.
- .3 Prevent insulation from being displaced or damaged while placing vapour retarder and placing slab.

3.3 - PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.

- .2 Do not permit work to be damaged prior
to covering insulation.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Batt insulation in Interior wall construction.
- .2 Blanket insulation for filling perimeter window and door shim spaces.

1.2 - RELATED SECTIONS

- .1 Section 07 21 13 - Board Insulation.
- .2 Section 07 26 00 - Vapour Retarders: Vapour retarder materials to adjacent insulation.
- .3 Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation.

1.3 - REFERENCES

- .1 ASTM C665-12 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .2 ASTM E84-13a - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .3 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .4 CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings (Includes Amendment 1, 2012).
- .5 NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials, 2006 Edition.
- .6 UL 723-2008 - Tests for Surface Burning Characteristics of Building Materials (10th Edition).

1.4- ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with Section 07 26 00 for installation of vapour retarder and Section 07 27 00 for air seal materials.

1.5 - SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on product characteristics, performance criteria, limitations.

1.6 - SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.7- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

Part 2 PRODUCTS

2.1 - MANUFACTURERS

- .1 Roxul; Product: Roxul Comfortbatt.
- .2 Other acceptable manufacturers offering functionally equivalent products.
- .3 Substitutions: Refer to Section 01 62 00.

2.2- MATERIALS

- .1 Insulation: CAN/ULC-S702
preformed mineral fibre, in batt
form; friction fit.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify that substrate, adjacent
materials, and insulation are dry and
ready to receive insulation.

3.2 - INSTALLATION

- .1 Install insulation to insulation
manufacturer's written instructions and
Section 07 26 00.
- .2 Install in Interior walls spaces
without gaps or voids. Do not compress
insulation.
- .3 Trim insulation neatly to fit spaces.
Insulate miscellaneous gaps and voids.
- .4 Coordinate work of this section with
construction of vapour retarder
specified in Section 07 26 00.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Foamed-in-place in exterior framed walls.
- .2 Foamed-in-place insulation at junctions of dissimilar wall materials to achieve a thermal seal.

1.2- REFERENCES

- .1 ASTM C1029-13 - Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
- .2 ASTM E84-13a - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .3 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .4 CAN/ULC-S705.1-01 - Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Material - Specification (Includes Amendments 1 and 2, 2005).
- .5 CAN/ULC-S705.2-05 - Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Application.
- .6 CUFCA (The Canadian Urethane Foam Contractors Association).

1.3 - ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.

- .2 Coordinate work to ensure timely placement of insulation within construction spaces.

1.4- SUBMITTALS FOR REVIEW

- .1 Product Data: Provide product description, insulation properties, preparation requirements

1.5 - SUBMITTALS FOR INFORMATION

- .1 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.6- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.7- QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience, and licensed and certified by the SPF Quality Assurance Program used by CUFGA.

1.8 - REGULATORY REQUIREMENTS

- .1 Conform to applicable code for concealment requirements.
- .2 Locate where directed by Consultant.
- .3 Approved mock-up may remain as part of the Work.

Part 2 PRODUCTS

2.1 - MANUFACTURERS

- .1 BASF; Product: WallTite Eco.
- .2 Other acceptable manufacturers offering functionally equivalent products.
 - .1 PolarFoam; Product: PF-7300-0 Soya.
- .3 Substitutions: Refer to Section 01 62 00.

2.2 - MATERIALS

- .1 Insulation: Spray-applied rigid cellular polyurethane:
 - .1 Thermal Resistance: 2.45 M².K/W
 - .2 Compressive Strength at yield or 10 % deformation: 186 kPa 27 psi.
 - .3 Water Vapor Permeability, max, 4.4 ng/Pa·s·m 3.0 perm-inches.
 - .4 Water Absorption, maximum): 5%.
 - .5 Tensile Strength (minimum), 200kPa 32 psi.
 - .6 Closed cell content (minimum): 90%.

2.3- ACCESSORIES

- .1 Primer: As required by insulation manufacturer.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify existing conditions before starting work.
- .2 Verify work within construction spaces or crevices is complete prior to insulation application.
- .3 Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.2 - PREPARATION

- .1 Mask and protect adjacent surfaces from over spray or dusting.
- .2 Apply primer in accordance with manufacturer's written instructions.

3.3 - INSTALLATION

- .1 Apply insulation to CAN/ULC-S705.2 and manufacturer's written instructions.
- .2 Apply insulation by spray method, to a uniform monolithic density without voids.
- .3 Apply to a minimum cured thickness of to meet current wall stud depth or existing wall stud depths.
- .4 Apply overcoat monolithically, without voids to fully cover foam insulation.
- .5 Patch damaged areas.

3.4- PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Do not permit subsequent construction work to disturb applied insulation.

3.5 - SCHEDULES

- .1 As indicated on drawings

END OF SECTION

Part 1 GENERAL

1.1 SECTION INCLUDES

- .1 Ceiling: Loose insulation poured into joist spaces through access holes.

1.2 RELATED SECTIONS

- .1 Section 07 26 00 - Vapour Retarders: Vapour retarder materials to adjacent insulation.
- .2 Section 06 11 00 - Wood Framing

1.3 REFERENCES

- .1 ASTM C739-11 - Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation.
- .2 ASTM C764-11- Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation.
- .3 CAN/ULC-S101-07 - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
- .4 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .5 CAN/ULC-S703-09 - Standard for Cellulose Fibre Insulation (CFI) for Buildings.

1.4 SYSTEM DESCRIPTION

- .1 Assembly of components includes providing continuity of thermal barrier at building enclosure elements, in conjunction with Section 07 21 16 and 07 21 13.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.

- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with Section 07 21 13 and 07 21 16 for placement of insulation materials.

1.6 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on product characteristics, performance criteria, limitations.

1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, perimeter conditions requiring special attention.
- .3 Manufacturer's Certificate: Certify that Products meet or exceed [specified requirements].

1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

Part 2 PRODUCTS

2.1 MANUFACTURERS

- .1 Thermo-Cell Industries Ltd.
- .2 Product - ProCell Green
- .3 Other acceptable manufacturers offering functionally.
- .4 Substitutions: Refer to Section 01 62 00.

2.2 MATERIALS

- .1 Cellulose Fibre Insulation: CAN/ULC-S703-09, Type 1; chemically treated, cellulosic fibre loose-fill type thermal insulation, nodulated for hand poured placement, thermal resistance R-40.

Part 3 EXECUTION

3.1 EXAMINATION

- .1 Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.
- .2 Verify that light fixtures have thermal cut-out device to restrict over-heating in soffit or ceiling spaces.
- .3 Verify spaces are unobstructed to allow placement of insulation.

3.2 INSTALLATION

- .1 Install insulation to manufacturer's instructions.
- .2 Place insulation tight in joist spaces.
- .3 Completely fill intended spaces. Leave no gaps or voids.

3.3 CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Remove loose insulation residue.

3.4 SCHEDULES

- .1 Attic Spaces: Pour insulation between ceiling joists to achieve an R-40

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Sheet and sealant materials for controlling vapour diffusion.

1.2 - RELATED SECTIONS

- .1 Section 07 21 13 - Board Insulation: Insulation and vapour retarder.

1.3- REFERENCES

- .1 ASTM C920-14 - Standard Specification for Elastomeric Joint Sealants.
- .2 ASTM C1311-10 - Standard Specification for Solvent Release Sealants.
- .3 ASTM E96/E96M-13 - Standard Test Methods for Water Vapor Transmission of Materials.
- .4 CAN/CGSB 51.33-M89 - Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .5 CAN/CGSB 51.34-M86 - Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

1.4- DEFINITION

- .1 Vapour Retarder: A material or assembly of materials that resists water vapour diffusion through it.

1.5 - SYSTEM DESCRIPTION

- .1 Materials and installation methods to provide continuity of vapour retarder:
 - .1 In conjunction with materials described in Section 07 21 13.

1.6- PERFORMANCE REQUIREMENTS

- .1 Vapour Permeability (Perm): Maximum water vapour permeance of 57.4 ng/(Pa•s•sq m) 1.0 perm measured to CAN/CGSB 51.34 CAN/CGSB 51.33.

1.7 - ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with other work having a direct bearing on work of this section.
 - .1 Sequence Work to permit installation of materials in conjunction with other retardant materials and seals.
 - .2 Do not install vapour retarder until items penetrating it are in place.

1.8 - SUBMITTALS FOR REVIEW

- .1 Product Data: Provide data indicating material characteristics, performance criteria, limitations.

1.9 - SUBMITTALS FOR INFORMATION

- .1 Installation Data: Manufacturer's special installation requirements, including preparation and installation requirements, techniques.

1.10 - CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.11 - QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work in accordance with SWRI requirements for materials and installation.

Part 2 PRODUCTS

2.1 - SHEET MATERIALS

- .1 Sheet Retarder Type 1: CAN/CGSB 51.34, polyethylene film for Below grade application, 0.25 mm 10 mil thick; a perm rating of 0.0183.
 - .1 Product: Plastic Vapour Retarder, manufactured by W.R. Meadows.

2.2- SEALANTS

- .1 Polyurethane Tape: Perminator Tape by W.R. Meadows
- .2 Primer: Recommended by sealant manufacturer to suit application.
- .3 Cleaner: Non-corrosive type; recommended by sealant manufacturer; compatible with adjacent materials.

2.3- ACCESSORIES

- .1 Tape: Polyethylene Pressure Sensitive Adhesive, 4 inch wide, compatible with sheet material.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify condition of substrate and adjacent materials.

3.2 - PREPARATION

- .1 Remove loose or foreign matter which might impair adhesion.
- .2 Clean and prime substrate surfaces to receive adhesive in accordance with manufacturers' written instructions.

3.3 - INSTALLATION

- .1 Install materials to manufacturer's written instructions.

END OF SECTION

Part 1 GENERAL

1.1 SECTION INCLUDES

- .1 Face panels.
- .2 Accessory components.

1.2 RELATED SECTIONS

- .1 Section 05 12 00: Structural Steel:
Structural steel building frame.
- .2 Section 05 41 00 - Structural Metal
Lightweight Framing: Stud wall framing
system.
- .3 Section 07 21 13 - Board Insulation:
Rigid insulation.
- .4 Section 07 21 16 - Blanket Insulation:
Blanket insulation.
- .5 Section 07 26 00 - Vapour Retarders.

1.3 REFERENCES

- .1 ASTM A653/A653M-13 - Standard
Specification for Steel Sheet, Zinc-
Coated (Galvanized).
- .2 ASTM A792/A792M-10 - Standard
Specification for Steel Sheet, 55%
Aluminum-Zinc Alloy-Coated by the Hot-
Dip Process.
- .3 ASTM B209M-10 - Standard Specification
for Aluminum and Aluminum-Alloy Sheet
and Plate.
- .4 ASTM B209-10 - Standard Specification
for Aluminum and Aluminum-Alloy Sheet
and Plate.
- .5 ASTM C612-10 - Standard Specification
for Mineral Fiber Block and Board
Insulation.

- .6 ASTM C665-12 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .7 ASTM C834-10 - Standard Specification for Latex Sealants.
- .8 ASTM C920-14 - Standard Specification for Elastomeric Joint Sealants.
- .9 ASTM E84-13a - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .10 CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings (Includes Amendment 1, 2012).

1.4 SYSTEM DESCRIPTION

- .1 Wall System: Preformed and prefinished single skin metal siding panels with vertical profile to match existing siding profile (assumed DR-36 Vic West Wall Panel); fastened to existing wood framing system

1.5 PERFORMANCE REQUIREMENTS

- .1 Components: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with 2012 OBC code.
- .2 Maximum Allowable Deflection of Steel Panel: $L/240$ of span.
- .3 Maximum Allowable Deflection of Aluminum Panel: $L/60$ of span.
- .4 Thermal Movement: Provide for expansion and contraction within system components caused by a cycling temperature range of 68 degrees F, ambient; 104 degrees F over a 12-hour

hour period without overstressing components causing buckling, failure of connections, or other detrimental effects.

- .5 Design expansion joints to accommodate movement in cladding and between cladding and structure to prevent permanent distortion or damage to cladding.
- .6 Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with applicable code.
- .7 Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

1.6 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other Work having a direct bearing on Work of this section.
 - .2 Coordinate the Work with installation of louvers, components, doors, windows, materials.
- .3 Pre-Installation Meeting:
 - .1 Review construction schedule, material availability, personnel, equipment, facilities and other relevant issues to avoid unnecessary delays.
 - .2 Review methods and procedures related to panel installation, including manufacturer's written instructions.

1.7 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings:
 - .1 Indicate arrangement of cladding system, including dimensions, location of joints, profiles of outer panels, types and locations of supports, fasteners, flashing, closures and all metal components related to cladding installation.
 - .2 Provide Shop Drawings stamped and signed by a Professional Engineer registered or licensed in the Province of Ontario, Canada.
- .3 Samples:
 - .1 Samples for Selection: Submit samples of color chart showing manufacturer's full range of standard colors for selection.
 - .2 Samples for Verification: Submit samples, 4 x 4 inches showing cladding profile in selected colour, finish and texture.

1.8 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Submit manufacturer's installation instructions, special handling criteria, installation sequence, and cleaning procedures.
- .3 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .4 Certificates: Provide product certificates signed by manufacturer certifying materials comply with

specified performance characteristics and criteria and physical requirements.

1.9 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Maintenance Data: Submit maintenance data for cleaning and maintenance of panel finishes for incorporation into O & M manual.

1.10 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Structural design to CSA-S136.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .4 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.11 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- .3 Store prefinished material off ground protected from weather, to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal

1.12 ACCESSORIES

- .1 Flashing and Trim: Of same material, colour and gloss as cladding in exposed locations; galvanized material in non-exposed locations; preformed corner pieces, double back exposed edges.
- .2 Closures: Manufacturer's standard metal closures and trims, to suit cladding profile.
- .3 Gaskets: Manufacturer's standard type, suitable for use with system, permanently resilient; ultraviolet and ozone resistant; colour as selected.
- .4 Sealants:
 - .1 Concealed Sealant: Tape or compound, non-skinning, non-drying, butyl rubber.
 - .2 Exposed Sealant: ASTM C920, silicone single component, colour to match cladding.
- .5 Fasteners: Galvanized self-tapping, with exposed heads painted to match cladding.
- .6 Field Touch-up Paint: As recommended by panel manufacturer.
- .7 Bituminous Paint: Asphalt base.
- .8 Expansion Joints: Same material, thickness and finish as exterior sheets type, of profile to suit system.
- .9 Anchors: Galvanized steel.

1.13 COMPONENTS

- .1 Cladding Panels: Precoated, galvanized steel to match existing barn cladding in profile, gauge, colour.

1.14 FABRICATION

- .1 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .2 Factory fabricate components ready for field installation, in longest practicable lengths.
- .3 Fabricate corners in single continuous piece with minimum 18 inches.

Part 2 Execution

2.1 EXAMINATION

- .1 Verify existing conditions before starting work.
- .2 Verify dimensions, tolerances, and method of attachment with other work.
- .3 Verify that field measurements are as indicated on Shop Drawings.
- .4 Report unsatisfactory conditions to Consultant in writing; do not start Work until unsatisfactory conditions are rectified.

2.2 INSTALLATION

- .1 Install components to manufacturer's written instructions.
- .2 Weather Barrier Membrane:
 - .1 Weather lap edges 6 inches and ends minimum 6 inches.
 - .2 Stagger vertical joints of each layer.
 - .3 Securely staple in place.
- .3 Exterior Cladding:
 - .1 Install wall cladding to manufacturer's standard installation procedures, providing proper laps true to line, and

- tight fitting to ensure a weather-tight face.
- .2 Install finishing flashing, cap flashing, trims and closures.
- .3 Attach components in manner not restricting thermal movement.
- .4 Sealants: Install sealants at junctions with adjoining work and where shown on Drawings, in accordance with Section 07 92 00.

2.3 ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Offset from True Alignment between Adjacent Members Butting or In Line: 1/16 inch.
- .3 Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

2.4 CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Remove site cuttings from finish surfaces.
- .3 Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.
- .4 Repair and touch up very minor surface damage with colour-matching high grade enamel.
- .5 Replace damaged panels and components that, in the opinion of the Consultant cannot be satisfactorily repaired.

Part 1 General

1.1 SECTION INCLUDES

- .1 Preparing substrate surfaces.
- .2 Sealant and joint backing.
- .3 Structural sealant for glazing assemblies.

1.2 RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete: Sealants required in conjunction with cast-in-place concrete.
- .2 Section 07 26 00 - Vapour Retarders: Sealants required in conjunction with vapour retarder.
- .3 Section 07 46 16 - Preformed Metal Siding: Sealants required in conjunction with siding.
- .4 Section 08 11 13 - Metal Doors and Frames: Sealants required in conjunction with door frames.
- .5 Section 08 80 50 - Glass and Glazing: Sealants required in conjunction with glazing methods.

1.3 REFERENCES

- .1 ASTM C834-10 - Standard Specification for Latex Sealants.
- .2 ASTM C919-12 - Standard Practice for Use of Sealants in Acoustical Applications.
- .3 ASTM C920-14 - Standard Specification for Elastomeric Joint Sealants.
- .4 ASTM C1184-13 - Standard Specification for Structural Silicone Sealants.
- .5 ASTM C1193-13 - Standard Guide for Use of Joint Sealants.

- .6 ASTM C1311-10 - Standard Specification for Solvent Release Sealants.
- .7 ASTM C1330-02(2013) - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- .8 ASTM C1401-09a - Standard Guide for Structural Sealant Glazing.
- .9 ASTM C1481-12 - Standard Guide for Use of Joint Sealants with Exterior Insulation and Finish Systems (EIFS).
- .10 ASTM E330/E330M-14 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

1.4 PERFORMANCE REQUIREMENTS

- .1 Sealant Design: Design structural sealant to withstand specified loads without breakage, loss, failure of seals, product deterioration, and other defects.
- .2 Design installed sealant to withstand:
 - .1 Dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall as measured in accordance with ASTM E330.
 - .2 Movement from ambient temperature range of 120 degrees F.
 - .3 Movement and deflection of structural support framing.
 - .4 Water and air penetration.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.

- .2 Coordinate the work with all sections referencing this section.

1.6 SUBMITTALS FOR REVIEW

- .1 Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, colour availability.
- .2 Structural Sealant Joint Design: Provide calculations for structural bite, dead load support, glueline thickness, shear, and other parameters.
- .3 Structural Sealant Joint Design: Confirmation that design data provided by Consultant have been reviewed and approved by sealant manufacturer.
- .4 Shop Drawings: Indicate sealant joints and dimensions, materials, structural bite, glueline thickness, joint profile, and support framing.

1.7 SUBMITTALS FOR INFORMATION

- .1 Installation Data: Manufacturer's special installation requirements.
 - .1 Indicate special procedures, surface preparation, perimeter conditions requiring special attention, [field quality control testing].

1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.9 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform sealant application work to ASTM C1481 ASTM C1193.

- .3 Perform structural sealant application work to ASTM C1401.
- .4 Perform acoustical sealant application work to ASTM C919.
- .5 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years experience.
- .6 Applicator Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.10 MOCK-UP

- .1 Provide mock-up to include sealant joints in conjunction with window and wall.
- .2 Locate where directed by Consultant.
- .3 Approved mock-up may remain as part of the Work.

1.11 WARRANTY

- .1 Section 01 78 10: Warranties.
- .2 Provide a five (5) year warranty to include coverage for failure to meet specified requirements.
- .3 Warranty: Include coverage for installed sealants and accessories which fail to achieve water tight seal, air tight seal, exhibit loss of adhesion or cohesion, or do not cure.
- .4 Provide manufacturer's twenty (20) year material warranty for installed silicone sealant.

Part 2 Products

2.1 SEALANTS

- .1 Acrylic Sealant Type D: ASTM C920, single component, solvent curing, non-staining, non-bleeding, non-sagging
 - .1 Elongation Capability 7.5% to 12%.
 - .2 Service Temperature Range 20 to 180 degrees F.
 - .3 Shore A Hardness Range 25 to 50.
 - .4 Product: Weatherban, manufactured by 3M Canada.
- .2 Siliconized Acrylic Latex Type E: ASTM C834; Type OP Grade; single component, non-sagging, non-staining, non-bleeding, paintable; colour CAN/CGSB 19.13 ASTM C834
 - .1 Elongation Capability 25%.
 - .2 Service Temperature Range 65 to 180 degrees F.
 - .3 Shore A Hardness Range 15 to 25.
- .3 Butyl Sealant Type F: ASTM C1311; single component, solvent release, non-skinning, non-sagging, black colour. ASTM C920
 - .1 Elongation Capability 7% to 10%.
 - .2 Service Temperature Range -20 to 180 degrees F.
 - .3 Shore A Hardness Range 10 to 30.
- .4 Silicone Sealant Type M: ASTM C920, multi-component, neutral curing, non-sagging, non-staining, non-bleeding, [meeting requirements of the Canadian Food Inspection Agency fungus resistant; colour by consultant.
 - .1 Elongation Capability 25%.
 - .2 Service Temperature Range 65 to 180 degrees F.
 - .3 Shore A Hardness Range 15 to 35.

2.2 ACCESSORIES

- .1 Joint Backing: ASTM C1330, round, closed cell polyethylene foam rod, oversized 30% to 50% larger than joint width.
- .2 Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- .3 Masking tape: Non-staining, non-absorbent type compatible with sealant and adjacent surfaces.
- .4 Setting Blocks and Spacers: Compatible with silicone sealant and recommended by sealant manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify that joint openings and substrate surfaces are clean, dry, and free of frost and ready to receive work.

3.2 PREPARATION

- .1 Remove loose materials and foreign matter which might impair adhesion of sealant.
- .2 Clean joints to sealant manufacturer's written instructions.
- .3 Perform preparation to ASTM C1193 for solvent release and latex base sealants.
- .4 Perform preparation to sealant manufacturer's written instructions.
- .5 Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

- .1 Perform installation in accordance with ASTM C1193 for solvent release and latex base sealants.
- .2 Install sealant to sealant manufacturer's written instructions.
- .3 Measure joint dimensions and size materials to achieve 2:1 width/depth ratios.
- .4 Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.
- .5 Install bond breaker where joint backing is not used.
- .6 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- .7 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- .8 Tool joints concave.

3.4 FIELD QUALITY CONTROL

- .1 Joint Sealants: Perform adhesion tests to manufacturer's written instructions and ASTM C1193,

3.5 MANUFACTURER'S FIELD SERVICES

- .1 Section 01 78 10: Prepare and start components.

3.6 CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Clean adjacent soiled surfaces.

3.7 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Remove masking tape and excess sealant.
- .3 Protect sealants until cured, remove temporary glass supports.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Hollow metal steel frames.
- .2 Exterior and interior glazed light frames; glass and glazing.

1.2- RELATED SECTIONS

- .1 Section 08 80 50 - Glazing.
- .2 Section 09 91 10 - Painting: Field painting of doors.

1.3- REFERENCES

- .1 ASTM A653/A653M-13 - Standard Specification for Steel Sheet, Zinc-Coated Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B29-03(2009) - Standard Specification for Refined Lead.
- .3 ASTM B749-03(2009) - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
- .4 ASTM C553-13 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
- .5 ASTM C578-13 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- .6 ASTM C591-13 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
- .7 ASTM C665-12 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .8 ASTM C1289-14 - Standard Specification for Faced Rigid Cellular

Polyisocyanurate Thermal Insulation Board.

- .9 ASTM E90-09 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- .10 ASTM E413-10 - Classification for Rating of Sound Insulation.
- .11 CAN/ULC-S104-10 - Standard Method for Fire Tests of Door Assemblies.
- .12 CAN/ULC-S105-09 - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.
- .13 CAN/ULC-S701-11 - Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .14 CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings (Includes Amendment 1, 2012).
- .15 CAN/ULC-S704-11 - Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .16 CSA-G40.20-13/G40.21-13 - General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel.
- .17 CSA-W59-13 - Welded Steel Construction (Metal Arc Welding).
- .18 FM (Factory Mutual).
- .19 CSDMA (Canadian Steel Door Manufacturers Association).
 - .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000.
 - .2 Recommended Selection and Usage Guide for Commercial Steel Doors and Frame Products, 2009.

1.4- ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with frame opening construction, door, and hardware installation.
- .2 Sequencing: Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

1.5 - SUBMITTALS FOR REVIEW

- .1 Product Data: Indicate door and frame configurations and finishes, location of cut-outs for hardware reinforcement.
- .2 Shop Drawings:
 - .1 Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.
 - .2 Indicate door elevations, internal reinforcement, closure method, and cut-outs for louvers, finishes glazing.

1.6- SUBMITTALS FOR INFORMATION

- .1 Installation Data: Manufacturer's special installation requirements.
- .2 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.7- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.8- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Conform to requirements of CSDMA.

- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.9 - REGULATORY REQUIREMENTS

- .1 Fire Rated Door and Frame Construction: Labelled and listed to CAN/ULC-S104.

1.10 - DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.
- .3 Store in vertical position, spaced with blocking to permit air circulation between components.
- .4 Store materials on planks or dunnage, out of water and covered to protect from damage.
- .5 Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

Part 2 PRODUCTS

2.1 - MANUFACTURERS

- .1 Fleming Door Products
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
- .3 Substitutions: Refer to Section 01 62 00.

2.2 - MATERIALS

- .1 Sheet Steel: Galvanized steel to ASTM A653/A653M, commercial grade (CS), Type B.
 - .1 Exterior Doors: Coating designation ZF120 A40.

- .2 Interior Doors: Coating designation ZF75 A25.
- .2 Reinforcement: CSA-G40.20/G40.21, Type 44W, ZF75 A25 coating designation to ASTM A653/A653M.

2.3 - DOOR CORE MATERIALS

- .1 Honeycomb Core: Structural small cell 1 inch maximum kraft paper honeycomb; weight 80 lb per ream minimum, density
- .2 1.03 pcf minimum, sanded to required thickness.
 - .1 Balance of core materials used in conjunction with lead to manufacturer's proprietary design.

2.4 - ADHESIVES

- .1 Cores and Steel Components: Heat resistant, structural reinforced epoxy, resin based adhesive.
- .2 Lock Seam: Reinforced epoxy resin, high viscosity, thicksotropic sealant.

2.5 - PRIMERS

- .1 Primer: Rust inhibitive touch-up only.

2.6 - ACCESSORIES

- .1 Door Silencers: Single stud rubber/neoprene.
- .2 Exterior Top Caps: Rigid polyvinylchloride (PVC) extrusion.
- .3 Frame Thermal Breaks: Rigid polyvinylchloride (PVC) extrusion.
- .4 Removable Glazing Stops: Formed galvanized steel channel, minimum 5/8 inch high, accurately fitted, butted at corners and fastened to frame sections with counter-sunk sheet metal screws.
- .5 Bituminous Coating: Fibred asphalt emulsion.

- .6 Weatherstripping: Resilient rubber set in steel frame.
- .7 Glass: Clear sheet glass, 1/4 thick.
- .8 Glass: As specified in Section 08 80 50.

2.7 - FABRICATION - DOORS

- .1 Exterior Doors: Welded stiffener construction.
- .2 Interior Doors: Laminated core Welded stiffener construction.
- .3 Longitudinal Edges: Continuously welded, filled and sanded with no visible edge seams.
- .4 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
- .5 Reinforce for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware.
- .6 Top and Bottom Channels: Inverted, recessed, welded steel channels.
- .7 Exterior Door: Flush PVC top caps.
- .8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

2.8- LAMINATED CORE CONSTRUCTION

- .1 Exterior Doors: Both face sheets 14 gauge steel, with honeycomb core, laminated under pressure to face sheets.
- .2 Interior Doors: Both face sheets 16 gauge steel with vertical steel stiffener core laminated under pressure to face sheets.
- .3 Fill voids between vertical stiffeners with fibreglass batt insulation.

2.9 - WELDED STIFFENER CONSTRUCTION

- .1 Exterior Doors: Both face sheets 14 gauge steel.
- .2 Interior Doors: Both face sheets 16 gauge steel.
- .3 Reinforce doors with vertical stiffeners, welded to each face sheet at 6 inches on center maximum.
- .4 Fill voids between vertical stiffeners with fibreglass batt insulation.

2.10 - FABRICATION - FRAMES

- .1 Exterior Frames:
 - .2 14 gauge thick base metal thickness.
 - .1 Frames: Welded type construction, thermally broken.
 - .2 Transom Frames, Sidelight and Window Assemblies: Welded type construction, thermally broken.
 - .3 Interior Frames: 16 gauge thick base metal thickness.
 - .1 Door Frames and Window Assemblies: Welded Slip-on type construction.
 - .2 Transom Frames: Welded type construction.
 - .4 Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
 - .5 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
 - .6 Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
 - .7 Terminate door stops 6 inches above finished floor. Cut stop at 90 degree angle and close.

2.11 - FINISHES

- .1 Factory Finish: colour as selected.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify that opening sizes and tolerances are acceptable; check floor area within path of door swing for flatness.
- .2 Verify doors and frames are correct size, swing, rating and opening number.
- .3 Remove temporary shipping spreaders.

3.2 - INSTALLATION

- .1 Install doors and frames to CSDMA.
- .2 Coordinate with wall construction for anchor placement.
- .3 Coordinate installation of glass and glazing.
- .4 Coordinate installation of doors and frames with installation of hardware.
- .5 Set frames plumb, square, level and at correct elevation.
- .6 Secure anchorages and connections to adjacent construction.
- .7 Ensure integrity of lead-lining between interior of frame and adjacent wall assembly.
- .8 Brace frames rigidly in position while building-in. Install wood spreaders at third points of frame rebate height to maintain frame width. Provide vertical support at centre of head for openings exceeding 48 inches in width.
- .9 Remove wood spreaders after frames have been built-in.
- .10 Make allowance for deflection to ensure structural loads are not transmitted to frame product.

- .11 Install doors, and hardware in accordance with hardware templates and manufacturer's instructions.
- .12 Adjust operable parts for correct clearances and function.
- .13 Install louvers, glazing and door silencers.
- .14 Finish paint as specified in Section 09 91 10.
- .15 Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 - ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Diagonal Distortion: 1/8 inch measured with straight edges, crossed corner to corner.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Hot-rolled primed steel windows.
- .2 Site glazed.
- .3 Perimeter sealant.

1.2 - RELATED SECTIONS

- .1 Section 07 92 00 - Joint Sealants:
Perimeter sealant and back-up
materials.
- .2 Section 08 80 50 - Glass and Glazing.
- .3 Section 09 91 10 - Painting: Field
painting.

1.3 - REFERENCES

- .1 AAMA 1503-09 - Voluntary Test Method
for Thermal Transmittance and
Condensation Resistance of Windows,
Doors, and Glazed Wall Sections.
- .2 AAMA/WDMA/CSA 101/I.S.2/A440-11 - NAFS
- North American Fenestration
Standard/Specification for Windows,
Doors, and Skylights.
- .3 ASTM A123/A123M-13 - Standard
Specification for Zinc (Hot-Dip
Galvanized) Coatings on Iron and Steel
Products.
- .4 ASTM A653/A653M-13 - Standard
Specification for Steel Sheet, Zinc-
Coated (Galvanized) or Zinc-Iron Alloy-
Coated (Galvannealed) by the Hot-Dip
Process.
- .5 ASTM E283-04(2012) - Standard Test
Method for Determining Rate of Air
Leakage Through Exterior Windows,
Curtain Walls, and Doors Under
Specified Pressure Differences Across
the Specimen.

- .6 ASTM E330/E330M-14 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .7 ASTM E331-00(2009) - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- .8 ASTM F588-07 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- .9 CAN/CGSB 1.40-97 - Anticorrosive Structural Steel Alkyd Primer.
- .10 CAN/CGSB 1.181-99 - Ready-Mixed Organic Zinc-Rich Coating.
- .11 SMA 1201R-2012 - Specification for Insect Screens for Windows, Sliding Doors, and Swinging Doors.
- .12 CSA-A440S1-09 - Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS - North American Fenestration Standard/Specification for windows, doors, and skylights.
- .13 CAN/CSA-A440.4-07 (R2012) - Window, Door, and Skylight Installation.
- .14 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.
- .15 SWI (Steel Windows Institute).

1.4 - SYSTEM DESCRIPTION

- .1 Windows: Hot rolled steel sections, factory fabricated, factory primed, vision glass, related flashings, anchorage and attachment devices.
- .2 Windows: SWI design.

- .3 Sash Configuration: Fixed, non-operable lights.

1.5- PERFORMANCE REQUIREMENTS

- .1 System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall to CSA-A440S1, Canadian Supplement
- .2 Member Deflection: Limit member deflection to flexure limit of glass [1/200] of the longer dimension; with full recovery of glazing materials.
- .3 Air Infiltration: Limit air infiltration through assembly to 0.06 cfm/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured to ASTM E283.
- .4 Vapour Seal: Vapour Seal with Interior Atmospheric Pressure of 1 inch sp, 72 degrees F, 40% RH: No failure.
- .5 Water Leakage: None, when measured to ASTM E331 with a test pressure difference of 2.86 lbf/sq ft.
- .6 System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system to the exterior by a weep drainage network.

1.6 - SUBMITTALS FOR REVIEW

- .1 Product Data: Provide component dimensions, anchorage and fasteners, glass.
- .2 Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work; installation requirements.

1.7 - SUBMITTALS FOR INFORMATION

- .1 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.8- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.9- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work to SWI. Maintain one (1) copy of document on site.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .4 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.10 - DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Protect factory finished surfaces with strippable coating. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

1.11 - ENVIRONMENTAL REQUIREMENTS

- .1 Do not install sealants when ambient temperature is less than 40 degrees F.
- .2 Maintain this minimum temperature during and after installation of sealants.

1.12 - WARRANTY

- .1 Section 01 78 10: Warranties.

- .2 Correct defective Work within a One (1) year period after Date of Substantial Completion.
- .3 Provide five (5) year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same.
- .4 Warranty: Include coverage for degradation of colour finish.

Part 2 PRODUCTS

2.1 - MANUFACTURERS

- .1 Fleming Door Products
- .2 Other acceptable manufacturers offering functionally equivalent products.
- .3 Substitutions: Refer to Section 01 62 00.

2.2 - MATERIALS

- .1 Steel: Hot rolled formed sash sections, hot-dip galvanized to ASTM A123/A123M, coating thickness appropriate grade for type and size of steel material indicated minimum coating thickness minimum coating thickness 4.2 lb/ft with slot for fitting weather stripping integral with sash section.

2.3 - COMPONENTS

- .1 Frames: 4 inch wide x 2 inch deep profile, non-thermally broken; flush glass stops of screw fastened type.
 - .2 Sills: Profile as per detail, formed steel; sloped for positive wash; fit under sash to 1/2 inch beyond wall face; one-piece full width of opening with jamb angles to terminate sill end.
- .1 Core: Rigid polystyrene insulation core.

2.4- GLASS AND GLAZING MATERIALS

- .1 Glass and Glazing Materials: As specified in Section 08 80 50 of Types described below:

2.5- SEALANT MATERIALS

- .1 Sealant and Backing Materials: As specified in Section 07 92 00 of Types described below.

2.6 - FABRICATION

- .1 Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- .2 Accurately fit and secure joints and corners. Make joints flush and hairline.
- .3 Prepare components to receive anchor devices. Fabricate anchors.
- .4 Arrange fasteners to conceal from view.
- .5 Prepare components with reinforcement for operating hardware.
- .6 Provide internal reinforcement in mullions with prime painted steel members to maintain rigidity.
- .7 Provide internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.

2.7- FINISHES

- .1 Window Frame Surface: Prime painted finish.
- .2 Concealed Steel Items: Primed with iron oxide paint, appropriate grade for type and size of steel material indicated.

- .3 Touch-Up Primer for Galvanized Steel Surfaces: MPI #18, inorganic zinc-rich primer.
- .4 Apply one (1) coat of bituminous paint to concealed steel surfaces in contact with cementitious or dissimilar materials.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify wall openings and adjoining materials are ready to receive work of this section.

3.2 - INSTALLATION

- .1 Install window frames glass and glazing to manufacturer's written instructions.
- .2 Install window assembly to CAN/CSA-A440.4.
- .3 Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- .4 Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- .5 Install sill and sill end angles.
- .6 Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .7 Install glass as specified in Section 08 80 50, to glazing method required to achieve performance criteria.

- .8 Install glass as specified in Section 08 80 50, exterior method of glazing.
- .9 Install perimeter sealant [to method required to achieve performance criteria.

3.3 - ERECTION TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation from Level or Plumb: 1/8 inch in 10 ft, whichever is less.

3.4- CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Remove protective material from factory finished surfaces.
- .3 Remove labels and visible markings.
- .4 Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.
- .5 Remove excess sealant by method acceptable to sealant manufacturer.

3.5 - PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Do not permit continuing construction activities near unprotected finish surfaces.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Hardware for hollow steel doors.
- .2 Thresholds.
- .3 Weatherstripping, seals, and door gaskets.

1.2 RELATED SECTIONS

- .1 Section 08 12 13 - Standard Hollow Metal Frames.
- .2 Section 08 13 13 - Standard Hollow Metal Doors.

1.3 REFERENCES

- .1 CAN/ULC-S104-10 - Standard Method for Fire Tests of Door Assemblies.
- .2 CAN/ULC-S132-07 - Standard for Emergency Exit and Emergency Fire Exit Hardware.
- .3 CSDMA (Canadian Steel Door Manufacturers Association).
- .4 DHI (Door and Hardware Institute Canada) - AHC and EHC certification programs.
- .5 DHI (Door Hardware Institute) - A115 series.
- .6 DHI - Recommended Locations for Architectural Hardware for Flush Wood Doors (1993).
- .7 BHMA (Builders Hardware Manufacturers Association) - A156 Series Standards.
- .8 NFPA 80 - Standard for Fire Doors and Other Opening Protectives, 2013 Edition.
- .9 NFPA 252 - Fire Tests of Door Assemblies, 2012 Edition.
- .10 UL 10B-2008 - Fire Tests of Door Assemblies (10th Edition).

- .11 UL 305-2012 - Standard for Panic Hardware (6th Edition).

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with other work having a direct bearing on work of this section.
 - .1 Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
 - .2 Coordinate Owner's keying requirements during the course of the Work.
- .3 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings:
 - .1 Indicate locations and mounting heights of each type of hardware, schedules, catalogue cuts.
- .3 Samples:
 - .1 Submit one (1) sample of closer, latchset, lockset, hinge, illustrating style, colour, and finish.
 - .2 Samples will be incorporated into the Work.

1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.
- .3 Sustainable Design:

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Operation and Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- .3 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- .4 Record Documentation:
 - .1 Record actual locations of installed cylinders and their [master] key code.
 - .2 Keys: Deliver with identifying tags to [Owner] by security shipment direct from hardware supplier.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 40: Maintenance and extra material requirements.

1.9 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work to the following requirements:
 - .1 [BHMA].
 - .2 [DHI A115 Series].
 - .3 [DHI WDHS-3].
 - .4 [CSDMA].
 - .5 [NFPA 80].
 - .6 [NFPA 252].
 - .7 [UL 10B].
 - .8 [UL 305].
 - .9 [CAN/ULC-S132].
 - .10 [CAN/ULC-S104].
 - .11 Maintain one (1) copy of each document on site.

- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .4 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.
- .5 for the purpose specified and indicated.

1.10 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.11 WARRANTY

- .1 Section 01 78 10: Warranties.
- .2 Provide five (5) year manufacturer warranty for door closers.

1.12

.1

Part 2 Products

2.1 SUPPLIERS

- .1 Acceptable Suppliers:
 - .1 Schlage.
 - .2 SARGENT.
- .2 Substitutions: Refer to Section 01 61 00

2.2 KEYING

- .1 Door Locks: Keyed in like-groups.
- .2 Include construction keying. Key to existing keying system.

- .3 Supply keys in the following quantities:
 - .1 5 master keys.

2.3 FINISHES

- .1 Finishes: Identified in Schedule at end of section.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that doors and frames are ready to receive work and dimensions are as [instructed by the manufacturer] [indicated on Shop Drawings].
- .3 Verify that electric power is available to power operated devices and is of the correct characteristics.

3.2 INSTALLATION

- .1 Install hardware to manufacturer's written instructions.
- .2 Use templates provided by hardware item manufacturer.

3.3 ADJUSTING

- .1 Adjust hardware for smooth operation.

3.4 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Do not permit adjacent work to damage hardware or finish.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Glass and glazing for doors [sections referencing this section for Products and installation hollow metal work windows.

1.2- RELATED SECTIONS

- .1 Section 07 92 00 - Joint Sealants: Sealant and back-up material.
- .2 Section 08 13 13 - Standard Hollow Metal Doors: Glazed doors.
- .3 Section 08 51 25 - Metal Windows: Glazed windows.

1.3- REFERENCES

- .1 ANSI Z97.1-2009 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- .2 ASTM C542-05(2011) - Standard Specification for Lock-Strip Gaskets.
- .3 ASTM C864-05(2011) - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- .4 ASTM C920-14 - Standard Specification for Elastomeric Joint Sealants.
- .5 ASTM C1036-11e1 - Standard Specification for Flat Glass.
- .6 ASTM C1048-12e1 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
- .7 ASTM C1172-09e1 - Standard Specification for Laminated Architectural Flat Glass.
- .8 ASTM C1193-13 - Standard Guide for Use of Joint Sealants.
- .9 ASTM C1503-08(2013) - Standard Specification for Silvered Flat Glass Mirror.

- .10 ASTM D412-06a(2013) - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.
- .11 ASTM D1149-07(2012) - Standard Test Methods for Rubber Deterioration-Cracking in an Ozone Controlled Environment.
- .12 ASTM D2240-05(2010) - Standard Test Method for Rubber Property - Durometer Hardness.
- .13 ASTM E84-13a - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .14 ASTM E283-04(2012) - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .15 ASTM E330/E330M-14 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .16 CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass.
- .17 CAN/CGSB 12.2-M91 - Flat, Clear Sheet Glass.
- .18 CAN/CGSB 12.3-M91 - Flat, Clear Float Glass.
- .19 CAN/CGSB 12.4-M91 - Heat Absorbing Glass.
- .20 CAN/CGSB 12.6-M91 - Transparent (One-Way) Mirrors.
- .21 CAN/CGSB 12.8-97 - Insulating Glass Units.
- .22 CAN/CGSB 12.9-M91 - Spandrel Glass.
- .23 CAN/CGSB 12.10-M76 - Glass, Light and Heat Reflecting.
- .24 CAN/CGSB 12.11-M90 - Wired Safety Glass.
- .25 CAN/CGSB 12.12-M90 - Plastic Safety Glazing Sheets.
- .26 CAN/CGSB 12.13-M91 - Patterned Glass.
- .27 CAN/CGSB 12.20-M89 - Structural Design of Glass for Buildings.
- .28 GANA (Glass Association of North America).
 - .1 GANA Glazing Manual (2008).
 - .2 GANA Laminated Glazing Reference Manual (2009).
 - .3 GANA Sealant Manual (2008).

.29 IGMA (Insulating Glass Manufacturers Alliance).

1.4 - PERFORMANCE REQUIREMENTS

- .1 Provide glass and glazing materials for continuity of building enclosure vapour retarder and air barrier:
 - .1 In conjunction with materials described in Section 07 92 00 07 26 00
 - .2 To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapour retarder seal.
 - .3 To maintain a continuous air barrier and vapour retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- .2 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as measured to ASTM E330/E330.
- .3 Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

1.5- SUBMITTALS FOR REVIEW

- .1 Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- .2 Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colours.

1.6- SUBMITTALS FOR INFORMATION

- .1 Certificates: Certify that Products meet or exceed specified requirements.
- .2 Manufacturer's Certificate: Certify that sealed insulated glass, meets or exceeds specified requirements.

1.7- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.8- MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 40: Maintenance and extra material requirements.

1.9- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work in accordance with GANA for glazing installation methods. Maintain one (1) copy of document on site.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.10 - ENVIRONMENTAL REQUIREMENTS

- .1 Do not install glazing when ambient temperature is less than 50 degrees F.
- .2 Maintain minimum ambient temperature before, during and twenty-four (24) hours after installation of glazing compounds.

1.11 - WARRANTY

- .1 Provide a five (5) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.
- .2 Provide a five (5) year warranty to include coverage for delamination of laminated glass and replacement of same.

Part 2 PRODUCTS

2.1 - FLAT GLASS MATERIALS

- .1 PPG Glass Canada
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
- .3 Substitutions: Refer to Section 01 62 00

- .4 Wired Glass (Type FG-J): CAN/CGSB 12.11, transparent woven stainless steel wire mesh style square of 1/2 inch grid size; minimum 1/4 inch thick.

2.2- SEALED INSULATING GLASS UNITS

- .1 PPG Glass Canada
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
- .3 Substitutions: Refer to Section 01 62 00.
- .4 Insulated Glass Units - Low E (Type SG-B): CAN/CGSB 12.8, double pane; hard pyrolitic coating on #2 surface within unit; interpane space filled with argon gas with silicone sealant edge seal; total unit thickness of 1 inch.
- .5 Edge Seal: Warm edge closed cell polymer foam edge seal; stainless steel, bent and spot welded corners.
- .6 Edge Seal Colour: Black.

2.3- GLAZING COMPOUNDS

- .1 Butyl Sealant (Type GC-B): ASTM C920, single Component; Shore A hardness of 10 to 20, colour black; non-skinning.

2.4- GLAZING ACCESSORIES

- .1 Lock Strip Gaskets: ASTM C54], ozone-resistant neoprene compound, with lock-strip component that friction-fits into position to retain glass pane/unit, reglet type tensile strength of 2000 psi tested to ASTM D412, Durometer hardness of 75 tested to ASTM D2240, sized to accommodate glass thickness.
- .2 Setting Blocks: ASTM C864, Option I Neoprene; 80 to 90 Shore A durometer hardness tested to ASTM D2240, length of 1 inch for each sq ft of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- .3 Spacer Shims: ASTM C864, Neoprene, 50 to 60 Shore A durometer hardness tested to ASTM D2240, minimum 3 inch long x one half the height of the glazing stop x thickness to suit application [self adhesive on one face].

- .4 Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness tested to ASTM D2240; coiled on release paper.
- .5 Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2%, designed for compression of 25% to effect an air barrier and vapour retarder seal.
- .6 Glazing Gaskets : ASTM C864, Option I, Resilient silicone extruded shape to suit glazing channel retaining slot; Black colour.
- .7 Glazing Clips: Manufacturer's standard type.

2.5- SOURCE QUALITY CONTROL AND TESTS

- .1 Test samples to ASTM E546.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 - PREPARATION

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.
- .4 Install sealant in accordance with manufacturer's written instructions.

3.3 - INSTALLATION - EXTERIOR DRY METHOD (TAPE AND GASKET SPLINE
GLAZING)

- .1 Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
- .2 Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- .3 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- .4 Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- .5 Trim protruding tape edge.

3.4- FIELD QUALITY CONTROL

- .1 Inspection will monitor quality of glazing.

3.5- CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Remove glazing materials from finish surfaces.
- .3 Remove labels after Work is complete.
- .4 Clean glass and adjacent surfaces.

3.6 - PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Gypsum board and joint treatment.
- .2 Light gauge metal stud wall framing.
- .3 Metal channel ceiling framing.

1.2- REFERENCES

- .1 ANSI A118.9 - Specifications for Test Methods and Specifications for Cementitious Backer Units.
- .2 ASTM C475/C475M-12 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .3 ASTM C514-04(2009)e1 - Standard Specification for Nails for the Application of Gypsum Board.
- .4 ASTM C557-03(2009)e1 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- .5 ASTM C645-13 - Standard Specification for Nonstructural Steel Framing Members.
- .6 ASTM C665-12 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .7 ASTM C754-11 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .8 ASTM C840-13 - Standard Specification for Application and Finishing of Gypsum Board.
- .9 ASTM C1002-07(2013) - Standard Specification for Steel Self-Piercing

- Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .10 ASTM C1047-10a - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .11 ASTM C1278/C1278M-07a(2011) - Standard Specification for Fiber-Reinforced Gypsum Panel.
 - .12 ASTM C1288-99(2010) - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.
 - .13 ASTM C1325-08b - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
 - .14 ASTM C1396/C1396M-13 - Standard Specification for Gypsum Board.
 - .15 ASTM E90-09 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - .16 CAN/ULC-S101-07 - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
 - .17 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .18 CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings (Includes Amendment 1, 2012).
 - .19 Gypsum Association GA-214-10 - Recommended Levels of Gypsum Board Finish.
 - .20 Gypsum Association GA-216-13 - Application and Finishing of Gypsum Panel Products.
 - .21 Gypsum Association GA-600-12 - Fire Resistance Design Manual.

- .22 Gypsum Association GA-801-07 - Handling and Storage of Gypsum Panel Products: A Guide for Distributors, Retailers, and Contractors.
- .23 UL - Fire Resistance Directory.
- .24 ULC-FR-14 - Fire Resistance Directory (2014 Edition).

1.3- SUBMITTALS FOR REVIEW

- .1 Product Data:
 - .1 Provide data on metal framing, gypsum board, cementitious backer board, joint tape.

1.4- SUBMITTALS FOR INFORMATION

- .1 Installation Data: Manufacturer's special installation requirements.

1.5- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.6- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work in accordance with ASTM C840 Maintain one (1) copy on site.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.
- .4 Handling Gypsum Board: Comply with GA-801.

Part 2 PRODUCTS

2.1 - MANUFACTURERS

- .1 Georgia-Pacific; Product: ToughRock Fireguard X.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
- .3 Substitutions: Refer to Section 01 62 00.

2.2 - FRAMING MATERIALS

- .1 Studs and Tracks: Specified in Section 09 22 16.
- .2 Studs and Tracks: ASTM C645; galvanized sheet steel, 18 gauge.
- .3 Furring, Framing, and Accessories: ASTM C645.
- .4 Furring, Framing, and Accessories: Specified in Section 09 22 16.
- .5 Fasteners: ASTM C1002.
- .6 Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- .7 Adhesive: ASTM C557.

2.3 - GYPSUM BOARD MATERIALS

- .1 Gypsum Board - abuse resistant: ASTM D3274, paperless, glass fibre-reinforced, impact resistant; maximum available length in place; tapered edges, ends square cut.

2.4- ACCESSORIES

- .1 Corner Beads: ASTM C1047 , metal corner bead.
- .2 Edge Trim: ASTM C1047 Type L bead.

- .3 Joint Materials: ASTM C475/C475M.
 - .1 Reinforcing tape, adhesive, and water.
 - .2 Joint compound: Asbestos-free.
- .4 Gypsum Board Fasteners: ASTM C1002,
- .5 Cementitious Board Fasteners: Board manufacturer's purpose made screws, corrosion resistant steel, self-drilling points, counter-sink heads to prevent strip-out, for steel substrate.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify that site conditions are ready to receive work and opening dimensions are as instructed by the manufacturer.

3.2 - METAL STUD INSTALLATION

- .1 Install studs to ASTM C475/C475M manufacturer's written instructions.
- .2 Metal Stud Spacing: 16 inches on centre.
- .3 Extend stud framing to ceiling only. Attach ceiling runner securely to ceiling framing to details indicated.
- .4 Refer to Drawings for indication of partitions extending stud framing through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
- .5 Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.

- .6 Blocking: Nail or screw wood blocking to studs. Install blocking for support of wall cabinets wood frame opening.

3.3- FURRING FOR FIRE RATINGS

- .1 Install furring as required to GA-600 requirements.

3.4 - CEILING FRAMING INSTALLATION

- .1 Install to manufacturer's written instructions ASTM C754.
- .2 Coordinate location of hangers with other work.
- .3 Install ceiling framing independent of walls, columns, and above ceiling work.
- .4 Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.
- .5 Laterally brace entire suspension system.

3.5- GYPSUM BOARD INSTALLATION

- .1 Install gypsum board to ASTM C840 manufacturer's written instructions.
- .2 Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- .3 Use screws when fastening gypsum board to metal furring or framing.
- .4 Use screws when fastening gypsum board to wood furring or framing.
- .5 Place control joints consistent with lines of building spaces as directed.
- .6 Place corner beads at external corners. Use longest practical length. Place

edge trim where gypsum board abuts
dissimilar materials [as indicated].

3.6- JOINT TREATMENT

- .1 Finish to ASTM C840, Level 3
- .2 Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
- .3 Feather coats on to adjoining surfaces so that camber is maximum 1/32 inch.
- .4 Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.
- .5 Fill and finish joints and corners of cementitious backing board.

3.7- TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 in any direction.

3.8 - SCHEDULES

- .1 Level 1: Above finished ceilings concealed from view.
- .2 Level 3: Walls exposed to view.
- .3 Level 4: Ceilings exposed to view.

END OF SECTION

Part 1 GENERAL

1.1 - SECTION INCLUDES

- .1 Formed metal framing of studs and furring, at interior locations and exterior locations as noted on drawings.
- .2 Framing accessories.

1.2 - RELATED SECTIONS

- .1 Section 09 21 16 - Wall sheathing.
- .2 Section 07 26 00 - Vapour Retarders.
- .3 Section 09 21 16 - Gypsum Board Assemblies: Gypsum board on metal studs for partitioning.

1.3- REFERENCES

- .1 ASTM A123/A123M-13 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A653/A653M-13 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM C645-13 - Standard Specification for Nonstructural Steel Framing Members.
- .4 ASTM C754-11 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .5 ASTM C1002-07(2013) - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .6 MPI (Master Painters Institute) - Architectural Painting Specifications Manual and Maintenance Repainting Manual.
- .7 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

1.4 - SYSTEM DESCRIPTION

- .1 Exterior Wall: Metal stud framing assembly with foam-in-place insulation specified in Section 07 21 19, interior gypsum board specified in Section 09 21 16.
- .2 Interior Walls: Metal stud framing assembly with mineral fibre type insulation specified in Section 07 21 16, interior gypsum board specified in Section 09 21 16.

1.5- ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the placement of components within the stud framing assembly.

1.6 - SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data:
 - .1 Provide data describing standard framing member materials and finish, product criteria, load charts, limitations.
 - .2 Provide MSDS information for all products.
- .3 Shop Drawings:
 - .1 Indicate component details, framed openings anchorage to structure type and location of fasteners
 - .2 Describe method for securing studs to tracks, and for blocking and reinforcement to framing connections.

1.7- SUBMITTALS FOR INFORMATION

- .1 Installation Data: Manufacturer's special installation requirements.

1.8- CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

1.9- QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 ISO certification requirements.
- .2 Perform Work to ASTM C754. Maintain one (1) copy on site.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .4 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

Part 2 PRODUCTS

2.1 - MANUFACTURERS

- .1 Bailey
- .2 Other acceptable manufacturers offering functionally equivalent products.
- .3 Substitutions: Refer to Section 01 62 00.

2.2 - STUD FRAMING MATERIALS

- .1 Framing Assembly Components: ASTM C645.
- .2 Studs: ASTM A653/A653M, non-load bearing rolled steel, channel shaped, punched for utility access.
 - .1 Depth: As indicated on drawings
 - .2 Thickness: 18 gauge.
- .3 Tracks and Headers: Same material and thickness as studs, bent leg retainer notched to receive studs with provision for crimp locking to stud.
- .4 Ceiling Runners: With extended leg retainer.
- .5 Furring and Bracing Members: Of same material as studs; thickness to suit purpose.
- .6 Fasteners: ASTM C1002, self drilling, self tapping screws.

- .7 Sheet Metal Backing: 20 gauge, galvanized steel.
- .8 Anchorage Devices: Power actuated.
- .9 Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

2.3 - FABRICATION

- .1 Fabricate assemblies of framed sections to sizes and profiles required.
- .2 Fit, reinforce, and brace framing members to suit design requirements.
- .3 Fit and assemble in largest practical sections for delivery to site, ready for installation.

2.4 - FINISHES

- .1 Studs Tracks and Headers: Galvanize to Z180 60 zinc coating designation.
- .2 Accessories: Same finish as framing members.

Part 3 EXECUTION

3.1 - EXAMINATION

- .1 Verify that rough-in utilities are in proper location.

3.2 - ERECTION

- .1 Align and secure top and bottom runners at 24 inches on centre.
- .2 Place one (1) beads of acoustic sealant between runners and substrate studs and adjacent construction to achieve an air seal.
- .3 Achieve an air tight seal between runners and substrate with acoustic sealant.
- .4 Place one (1) beads of acoustic sealant between studs and adjacent vertical surfaces to achieve an air seal.
- .5 Achieve an air tight seal between studs and adjacent vertical surfaces with.

END OF SECTION

GENERAL

1.1 SECTION INCLUDES

- .1 Surface preparation.
- .2 Painting.

1.2 - RELATED SECTIONS

- .1 Section 05 50 00 - Metal Fabrications:
Shop primed items.

1.3 PRICE AND PAYMENT PROCEDURES

- .1 Alternatives: Section 01 62 00 -
Alternative Prices affecting this
section.

1.4 REFERENCES

- .1 MPI (Master Painters Institute) -
Architectural Painting Specifications
Manual and Maintenance Repainting
Manual.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with other
Work having a direct bearing on Work of
this section.
- .2 Scheduling:
 - .1 Schedule painting operations to
prevent disruption of and by other
trades.
 - .2 Schedule painting operations to
prevent disruption of occupants in
and about building.

1.6 SUBMITTALS FOR REVIEW

- .1 Product Data:
 - .1 Submit Product data on all
specified finishing products.

- .2 Submit two (2) copies of WHMIS MSDS - Material Safety Data Sheets.
- .2 Samples:
 - .1 Submit two (2) samples, in size illustrating range of colours [and textures] available for each surface finishing product scheduled.

1.7 SUBMITTALS FOR INFORMATION

- .1 Installation Data: Manufacturer's special installation requirements including special surface preparation procedures and substrate conditions requiring special attention.
- .2 Schedule:
 - .1 If requested, submit Work schedule for various stages of Work [when painting occupied areas] for Consultant's review and Owner's approval.
 - .2 Submit schedule minimum of forty-eight (48) hours in advance of proposed operations.

1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Record Documentation: Upon completion, provide itemized list of products used including the following:
 - .1 Manufacturer's name.
 - .2 Product name, type and use.
 - .3 Colour coding number.
 - .4 Manufacturer's Material Safety Data Sheets (MSDS).

1.9 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 40: Maintenance and extra material requirements.

- .2 Extra Stock Materials: Provide properly packaged maintenance material as follows.
 - .1 1 gal of each coating type and colour to Owner.
 - .2 Label each container with colour, type, texture and room locations in addition to manufacturer's label.

1.10 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum [five (5)] years [documented] experience.
- .2 Installer Qualifications: Qualified journeypersons or apprentices, provided they work under direct supervision of qualified journeyperson in accordance with trade regulations. Company specializing in performing the work of this section with minimum three (3) years documented experience].
- .3 Conform to MPI Painting Manual requirements for materials, preparation and workmanship.
- .4 Paint Products: Paint manufacturers and paint Products listed under the Approved Product List section of the MPI Painting Manual.
 - .1 Notify Consultant in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate condition or preparation.

1.11 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for flame and smoke rating requirements for finishes, storage, mixing, application

and disposal of paint and related waste materials.

1.12 DELIVERY, STORAGE, AND PROTECTION

- .1 Deliver products to site in sealed and labeled containers showing manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, colour designation, and written instructions for mixing and reducing.
- .2 Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in dry, ventilated area and as required by manufacturer's written instructions.
- .3 Provide adequate fireproof storage lockers and warnings as required by authorities having jurisdiction for storing toxic and volatile/explosive/flammable materials.

1.13 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Do not perform painting or decorating Work when ambient air and substrate temperatures are below 50 degrees F for both interior and exterior work, or as required by paint product manufacturer.
 - .2 Do not perform painting or decorating Work when relative humidity is above 85% or when dew point is less than 5 degrees F variance between the air/surface temperature required by paint Product manufacturer.
 - .3 Provide suitable weatherproof covering and sufficient heating facilities to maintain minimum ambient air and substrate temperatures for twenty-four (24)

hours before, during and after paint application.

- .4 Do not perform painting and decorating Work when maximum moisture content of substrate exceeds:
 - .1 Wood: 15%.
 - .2 Plaster and Gypsum Wallboard: 12 %.
 - .3 Concrete Floors: 8%.
- .5 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple cover patch test.
- .6 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .7 Provide minimum lighting level of 30 ft candles is provided on surfaces to be painted or decorated.

1.14 WASTE MANAGEMENT AND DISPOSAL

- .1 Dispose of waste materials in accordance with Local authorities having jurisdiction.
- .2 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .3 Place non-reusable materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .4 To reduce contaminants entering waterways, sanitary/storm drain systems or into the ground, adhere to the following procedures:
 - .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 Dry out empty paint cans prior to disposal or recycling.
 - .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.
- .5 Set aside and protect surplus and uncontaminated finish materials and deliver or arrange collection for verifiable re-use or re-manufacturing.

Products

1.15 MATERIALS

- .1 Use only materials (primers, paints, coatings, varnishes, stains, lacquers, fillers) listed in the latest edition of the MPI Approved Product List (APL) on this project.
- .2 Ancillary materials such as linseed oil, shellac, thinners, solvents to be of highest quality product and provided by an MPI listed manufacturer, and

- compatible with paint materials being used.
- .3 Where required, use only materials having a minimum MPI "Environmentally Friendly" E1 rating based on VOC (EPA Method 24) content levels.
 - .4 Where indoor air quality (odour) is an issue, use only MPI listed materials having a minimum E2 rating.
 - .5 Where possible, all materials to be lead and mercury free with low VOC content.
 - .6 Provide all material for each system from a single manufacturer.
 - .7 Fire Hazard: Flame spread and smoke developed ratings in accordance with [applicable code] [local authorities having jurisdiction].
 - .8 Patching Materials: Latex filler.
 - .9 Fastener Head Cover Materials: Latex filler.

1.16 MIXING AND TINTING

- .1 Coatings: Ready-mixed and pre-tinted; re-mix all 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 Paste, Powder or Catalyzed Paint: Mixed in accordance with manufacturer's written instructions.
- .3 Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
 - .1 Do not exceed paint manufacturer's recommendations for addition of

thinner. Do not use kerosene or any such organic solvents to thin water-based paints.

- .2 Thin paint for spraying in accordance with paint manufacturer's instructions.

1.17 GLOSS/SHEEN RATINGS

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

Gloss Level	Description	Gloss @ 60 degrees	Sheen @ 85 degrees
G1	Matte Finish (flat)	0 to 5	10 max.
G2	Velvet-Like Finish	0 to 10	10 to 35
G3	Eggshell Finish	10 to 25	10 to 35
G4	Satin-Like Finish	20 to 35	35 min.
G5	Traditional Semi-Gloss Finish	35 to 70	
G6	Traditional Gloss	70 to 85	
G7	High Gloss Finish	More than 85	

- .2 Gloss level ratings of painted surfaces [as noted on Finish Schedule] [as specified].

1.18 MANUFACTURERS

- .1 Paint Manufacturers:
 - .1 Glidden.
 - .2 Pratt & Lambert.
 - .3 PPG Industries.
 - .4 Substitutions: Refer to Section 01 62 00.

1.19 EXTERIOR PAINT SYSTEMS

- .1 Steel - Shop Primed:
 - .1 Touch-up with zinc rich primer.
 - .2 Two (2) coats of latex enamel, gloss finish.
- .2 Steel - Galvanized:
 - .1 One (1) coat galvanize primer.
 - .2 Two (2) coats of latex enamel, gloss finish.

1.20 INTERIOR PAINT SYSTEMS

- .1 Wood - Painted:
 - .1 One (1) coat of latex prime sealer.
 - .2 Two (2) coats of latex enamel, gloss finish.
- .2 Steel - Primed:
 - .1 Touch-up with latex primer.
 - .2 Two (2) coats of latex enamel, gloss finish.
- .3 Plaster, Gypsum Board:
 - .1 One (1) coat of alkyd primer sealer.
 - .2 Two (2) coats of latex semi-gloss finish.

Execution

1.21 EXAMINATION

- .1 Verify that substrate conditions are ready to receive work as instructed by the product manufacturer.
- .2 Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- .3 Test shop applied primer for compatibility with subsequent cover materials.
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.

1.22 PREPARATION

- .1 Prepare surfaces in accordance with MPI requirements.

- .2 Remove and store or mask miscellaneous hardware and surface fittings such as electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to painting. Clean and replace upon completion of painting Work in each area. Remove doors before painting to paint bottom and top edges and re-hung.
- .3 Protect adjacent surfaces and areas, including rating and instruction labels on doors, frames, equipment, piping, from painting operations with drop cloths, shields, masking, templates, or other suitable protective means.
- .4 Correct defects and clean surfaces which affect work of this section. Start of finish painting of defective surfaces indicates acceptance of substrate and making good defects will be at no cost to Owner.
- .5 Confirm preparation and primer used with fabricator of steel items.
- .6 Seal with shellac and seal marks which may bleed through surface finishes.
- .7 Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- .8 Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- .9 Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish: Remove foreign particles to permit adhesion of finishing materials. Apply [compatible] [latex based] sealer or primer.
- .10 Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- .11 Concrete Floors: Remove contamination; acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- .12 Copper Surfaces Scheduled for a Paint Finish: Remove contamination by steam, high pressure water, or solvent washing. Apply vinyl etch primer immediately following cleaning.

- .13 Copper Surfaces Scheduled for a Natural Oxidized Finish: Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for required effect. Once attained, rinse surfaces with clear water and allow to dry.
- .14 Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.
- .15 Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- .16 Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of trisodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- .17 Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- .18 Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
- .19 Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces, Prime metal items including shop primed items.
- .20 Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

- .21 Interior Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats.
- .22 Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

1.23 APPLICATION

- .1 Apply paint or stain in accordance with MPI Painting Manual Grade finish requirements.
- .2 Apply products to adequately prepared surfaces, within moisture limits and acceptable environmental conditions.
- .3 Apply paint finish in areas where dust is no longer being generated or when wind or ventilation conditions will not affect quality of finished surface.
- .4 Apply each coat to uniform finish.
- .5 Tint each coat of paint progressively lighter to enable confirmation of number of coats.
- .6 Unless otherwise approved, apply a minimum of four (4) coats of paint where deep or bright colours are used to achieve satisfactory results.
- .7 Sand and dust between each coat to provide an anchor for next coat and to remove defects visible from a distance up to 39 inch.
- .8 Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
- .9 Allow applied coat to dry before next coat is applied.

1.24 FIELD QUALITY CONTROL

- .1 Acceptable Surfaces:
 - .1 No visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 39 inch.
 - .2 No visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 39 inch.

- .3 No visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.
- .4 Uniformity of colour, sheen, texture, and hiding across full surface area.

1.25 CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

1.26 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

- .1 Metal Stairs (Section 05 51 00): Exposed surfaces of stringers exposed vertical risers.

END OF SECTION



SOIL PROBE

RE: GEOTECHNICAL INVESTIGATION
NEW TRANSPLANT GREENHOUSE
GREEN HOUSE AND PROCESSING CROPS RESEARCH CENTER
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FOR: Public Works and Government Services Canada (PWGSC)-Ontario Region
Architecture and Engineering Services
4900 Yonge Street
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Standing Offer Agreement: EQ754-131106/001/PWL
Contract No.: EQ754-161141/001/PWL
PWGSC Project No.: R.073376.001

ATTENTION: Ms. Isabelle Massicotte, M.Arch., OAA, Project Manager

REPORT NO.: 2015-27874

DATE: October 20, 2015

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October 20, 2015

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1.0 INTRODUCTION

Soil Probe Ltd. (herein "*Soil Probe*") was retained by Public Works and Government Services Canada (herein "*PWGSC*") to carry out a geotechnical investigation for the proposed New Transplant Greenhouse located at 2585 Essex County Road 20, Harrow, Ontario (herein "*the site*"), as per the contractual agreement for the project dated August 27, 2015.

It is understood that Agriculture and Agri-Food Canada's (AAFC) is planning to construct a new 416 m² 4-compartment production Transplant Greenhouse with an adjacent glass corridor, a new 66 m² headhouse and an enclosed walkway connecting to the main headhouse to fulfill AAFC's continued operational requirements.

As per the scope of services detailed in the Terms of Reference (TOR), the purposes of this investigation are:

- Carry out a geotechnical investigation to collect information on the soil and groundwater conditions at the site and based on the investigation data, provide pertinent engineering considerations and recommendations to assist with the design of the proposed building foundations and associated infrastructure; and,
- Carry out a topographic survey and subsurface utility location mapping.

This report presents the details of Soil Probe's fieldwork and laboratory testing, outlines the soil and groundwater conditions at the site, and provides recommendations on the aforementioned items. The report also includes a drawing of the topographic survey and subsurface utility location mapping works which has been undertaken for the site concurrently with the Geotechnical Investigation.

This report has been prepared for PWGSC, and their nominated engineers and designers. Third party use or reproduction, in part or in full, of this report is prohibited without written authorization from Soil Probe. This report is also subject to the *Statement of Limitations* which forms an integral part of this document.

2.0 SITE SETTING

2.1 SITE LOCATION

The site of the proposed New Transplant Greenhouse is located within a research farm owned and operated by the AAFC, on County Road 20 in Harrow, Ontario. The main building was designed and constructed circa 1967 by the Department of Public Works and Giffels Consulting Engineers. The complex is composed of a two-storey research wing, a one-story administration wing, research support spaces connected to several greenhouses, a main headhouse and a power plant.

The new Transplant Greenhouse site is located south west of the existing greenhouses and is to be connected to the existing main headhouse by a new corridor. Site works will include the relocation of existing roadways, surface water management and landscaping. The investigated site area is centred at approximate grid reference 342690, 4655200 (UTM 17T coordinates). Geodetic elevations at the site are between approximately 192 m and 193 m.

The site is located within the AAFC property to the south of County Road 20 (King Street East), and is approximately 1.5 km to the east of Harrow, Ontario.

A Site Location Plan is presented as Figure 1.

2.2 SITE DESCRIPTION

The site of the investigation is a relatively flat area located to the south west of the existing bank of greenhouses, in an area of maintained grassland. The site is bound to the north by County Road 20. An access roadway crosses the area under investigation.

As defined by the variation of geodetic elevations provided in Section 2.1, the site topography is generally flat. A selection of site photographs is presented as Figure 2.

2.3 PROPOSED DEVELOPMENT

As per the TOR this report addresses the site conditions in relation to the following project requirement:

- Transplant Greenhouse (32 m x 10 m);
- Header Corridor (32 m x 3 m);

- Headhouse (8m x 8m); and,
- Corridor to existing headhouse (2.5 m wide).

The layout of the proposed development project is presented on Figure 3 of this report. No design or load details for the proposed development were available at the time of authoring this report. It is also understood the proposed development includes a relocation of a roadway to the west from its current location through the site area.

2.4 PUBLISHED GEOLOGY

The surficial geology at the site, as indicated by the Ontario Geological Survey (OGS) Map P3253 “*Quaternary Geology – Essex County Area, Western Half*”, is understood to comprise Pleistocene glaciolacustrine beach and bar (near-shore) deposits, generally consisting of sands with minor silts and gravels. Glaciolacustrine silty clay deposits are anticipated to underlie the beach and bar deposits at depth. The Ministry of Northern Development and Mines (MNDM) Map P3255 “*Drift Thickness – Essex County Area (West Half)*” indicates the Pleistocene deposits to be approximately 38 m thick.

According to the Ministry of Natural Resources (MNR) Map P2396 “*Palaeozoic Geology of the Windsor-Essex and Pelee Island Area*”, the Pleistocene deposits are directly overlying bedrock of the Detroit River Group (Amherstburg Formation), consisting of vuggy dolostones, limestones and oolites. Based on the drift thickness, and with a minimum surface geodetic elevation of approximately 192 m, it is anticipated that bedrock subcrops the site at a geodetic elevation of approximately 154 m.

According to OGS data released in 1972, no significant depths of fill material are reported to be present beneath the site. However, some shallow depths of fill, associated with historical, agricultural grading at the site as well as with general development of the site locale, are anticipated.

Groundwater in the vicinity of the site is understood to be present at depths of between approximately 5 m and 8 m below existing ground level, and is associated with the shallow beach and bar sand deposits that are reported to underlie the site.

3.0 GROUND INVESTIGATION

3.1 FIELD INVESTIGATION

3.1.1 Soil Investigation

Prior to undertaking field drilling, clearance of existing public utility services to the site was obtained from all applicable agencies and companies. In addition, since the field works included a Topographical Survey and Subsurface Utility Engineering investigation, private utility locations were carried out.

The geotechnical investigation was carried out on September 18, 2015 and comprised of the drilling of four (4) boreholes (boreholes BH1 to BH4) using a truck-mounted CME 55 drilling rig equipped with solid stem, continuous flight augers. The locations of the boreholes were based on the proposed development layout, as shown on Figure 3, and the boreholes were advanced to depths of approximately 6.5 m below existing ground level.

All drilling equipment was supplied and operated by Sundin's Well Drilling Ltd. of Kingsville, Ontario, and the drilling works were completed under the full time supervision of a qualified Soil Probe Technician.

Standard Penetration Tests (SPTs) split spoon samples were collected in all drilled boreholes using a 50 mm outside diameter and 35 mm internal diameter split barrel sampler driven with a 63.5 kg automatic hammer dropping 760 mm. All soil samples were logged in the field and returned to Soil Probe's laboratory in Scarborough for review and subsequent laboratory testing.

The exploratory boreholes were located in the field by Soil Probe using a survey tape to measure offsets from existing site and adjacent site features. Geodetic elevations were established for each borehole on site from the topographical survey carried out as part of this investigation.

The logs of all boreholes completed, together with their depths relative to geodetic elevation, are presented in Appendix A.

3.1.2 Groundwater Investigation

The scope of the investigation also included for the installation of one (1), 50 mm diameter groundwater monitoring well which was installed in borehole BH3. The groundwater level in the monitoring well was noted during the course of the drilling works at the site.

The details of the groundwater observations are presented on the respective borehole log in Appendix A, and further discussion on groundwater is provided in Section 4.2 of this report.

3.2 GEOTECHNICAL FIELD AND LABORATORY TESTING

Standard Penetration Tests (SPTs) were undertaken at selected intervals with depth using a 50 mm outside diameter and 35 mm internal diameter split barrel sampler driven with an automatic hammer of mass 63.5 kg dropping 760 mm in accordance with the ASTM D 1586-11 test method – “*The Standard Method of Standard Penetration Testing (SPT)*”. The results of these tests (SPT “N” values) are presented on the borehole logs in Appendix A. Results of the in situ field testing are presented in Figure 4 of this report.

All soil samples were submitted to Soil Probe’s laboratory for natural moisture content determination. Based on the results presented in the borehole logs and in Appendix B, the moisture content increases with depth as presented on Figure 5. In addition, four (4) selected soil samples were submitted for grain size distribution testing.

The results of the geotechnical laboratory testing are presented on their respective laboratory testing certificates in Appendix B.

4.0 SUBSURFACE CONDITIONS

4.1 SOIL CHARACTERISATION

4.1.1 Overview

The geology encountered across the site was as anticipated from review of the available geological information as detailed in Section 2.4.

A detailed description of the subsurface conditions encountered in the boreholes completed at the site, including the geotechnical testing results, is presented on the boreholes logs in Appendix A.

4.1.2 Topsoil and Fill Soils

Topsoil was encountered at all four (4) borehole locations underlying grass, and comprised a 0.2 m to 0.75 m layer of silty sand and / or mixed soils.

Fill soils were encountered in all boreholes and generally comprised damp silty fine sand to fine sand. Fill thicknesses were reported between approximately 0.55 m and 1.20 m. It is important to note that fill thicknesses may vary throughout the site area, depending upon their location. As such, these findings should not be relied upon for any estimation of fill quantities to be stripped prior to construction.

The grain size distribution of one (1) silty sand sample taken from the fill material is presented on Figure C1 of Appendix C.

4.1.3 Native Soils

Native overburden soils were encountered directly underlying the fill materials in all boreholes, and comprise a fine to medium sand with occasional coarse sand and trace silt and gravels. These deposits were encountered to depths of between approximately 1.1 m and 6.7 m (bottom of borehole) below existing ground level.

The grain size distribution of three (3) sand samples taken from within the native deposits are presented on Figure C2 of Appendix C, and summarised in Table 1:

Table 1: Grain Size Distribution for Native Soils

Grain Size	(%) Percentage Distribution		
	BH2 (1.52 m – 1.98 m)	BH3 (3.04 m -3.5 m)	BH4 (1.52 m – 1.98 m)
Gravel	0	1	2
Sand	89	89	79
Fines	11	10	19

The moisture content test results were recorded throughout the sequence of deposits between approximately 5 % and 21 %, indicating generally moist to very moist conditions.

SPT “N” values for cohesionless sand deposits were recorded between 5 (borehole BH4) and in excess of 50 (borehole BH2), indicating the cohesionless deposits to be in a loose to very dense, but generally compact condition. As shown in Figure 4 it is observed that generally the “N” values increase with depth.

4.1.4 Bedrock

Bedrock was not encountered at the site during this investigation.

4.2 GROUNDWATER

Groundwater was only encountered in borehole BH1 during the intrusive drilling works, with the remaining boreholes proving dry on completion. Groundwater was encountered at depth of approximately 3.7 m below existing ground level, equating to geodetic elevations of approximately 188.9 m. The depth at which groundwater was encountered during drilling is presented on the respective borehole log in Appendix A.

One (1) monitoring well was installed in borehole BH3, which was dry at the completion of the borehole. This monitoring well can be used for long term readings and construction purposes.

It should be noted that the groundwater level can vary and is subject to seasonal fluctuations in response to major weather events. It should be also noted that a perched water condition may arise from the accumulation of surface water in the more pervious fill, particularly during wetter periods.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 FOUNDATIONS

Based on the ground conditions observed at the borehole locations, and the geotechnical testing completed for the investigation, it is considered by Soil Probe that foundations of the proposed structures can be supported by conventional strip or pad footings. All foundations for the proposed development should be founded on the undisturbed sandy soils.

5.1.1 Frost Susceptibility

The native sands encountered at shallow depths across the site are not considered sensitive to water and the physical and mechanical properties of the soils are not dependent on in-situ moisture content.

Based on the results of the grain size analyses completed on samples of the native sands, the shallow soils at the site are considered to have a moderate to high frost susceptibility, being classified as Frost Group "F4" per Table 13.1 of the "*Canadian Foundation Engineers Manual*", 4th Edition (herein "*CFEM*").

This given, the recommended depths for foundations provided in Section 5.1.2 of this report are considered to be below the maximum depth for frost penetration of 1 m in the Harrow area, as defined by the Ontario Provincial Standard Specification (here in "OPSS") 3090.101.

5.1.2 Assessment of Bearing Resistance

At the time of authoring this report, no finished floor elevation of the proposed development had been provided to Soil Probe. The finished floor levels of the Transplant Greenhouse, headhouse and the outdoor areas are understood to be at geodetic elevations of approximately 193 m, with no basement substructures proposed.

Soil Probe considers that the proposed structures can be supported by conventional strip or pad footing, of a minimum dimension 0.6 m (2ft) width and 1.2 m x 1.2 m (4ft x 4ft), respectively founded within the native cohesionless sand soils. The anticipated bearing values for minimum dimensions and founding elevations for the proposed buildings are summarized on Table 2.

Table 2: Bearing Capacities and Founding Elevations

Building	Footing	Bearing Capacities		Depth (m)	Uppermost Native Foundation Elevation	Comments
		Serviceability Limit State (SLS)	Factored Ultimate Limit State (ULS)			
Transplant Greenhouse and Headhouse	Strip (0.6 m width)	100 kPa	150 kPa	1.3	191.7 m	Fine to medium Sand
	Pad (1.2 m width)	120 kPa	180 kPa	1.3	191.7 m	Fine to medium Sand

Figures 6 and 7 present the bearing capacities for different footing widths at the Serviceability Limit State and Ultimate Limit State using a resistance factor of 0.5 respectively as per *Table 8.1 Geotechnical Resistance Factors for Shallow and Deep Foundations NBCC (2005)* from CFM.

Foundations for lightly loaded structures associated with the proposed outdoor facility, or for any external, lightly loaded structures to be associated with the two (2) proposed buildings can also be supported by conventional strip or pad foundations, of a minimum dimension of 1.2 m x 1.2 m, founded within the native cohesionless sandy soils.

The recommended bearing capacities and the corresponding founding elevations would need to be confirmed by a representative of Soil Probe during construction. It should be

noted that the recommended bearing capacities have been calculated by Soil Probe from the borehole information for the design stage only.

The investigation and comments should be considered on-going as new information of the underground conditions will continue to become available. For example, when more specific information is available with respect to conditions between boreholes when foundation construction is underway. Special attention will be required for the interaction between existing and new foundations. The interpretation between boreholes and the recommendations of this report must therefore be checked through field inspections carried out by Soil Probe to validate the information for use during construction.

5.1.3 Settlement Considerations

Based on the outline information provided for the proposed Transplant Greenhouse construction at the site, it is anticipated that of the loads to be applied to the ground by any such structure will be generally low in intensity. As such, associated settlements are not expected to be large, and the general limiting of the total settlement to less than 25 mm and the differential settlement to less than 19 mm by the recommended net bearing pressure is considered appropriate.

5.1.4 Earthquake Considerations

Using the information provided by the site investigation, the general soil profile comprises "Soft Soil" as defined by Table 4.1.8.4.A "Site Classification for Seismic Site Response" of the Ontario Building Code Act 1992, as amended in 2010. Therefore, when considering the foundation design recommendations provided in Section 5.1.2 of this report, a site classification for seismic response of "Class E" should be included for in foundation designs or re-assessments.

5.1.5 Earth Pressure Design Parameters

If required, sub-structure retaining elements designed to resist earth pressure can be calculated based on the following equation:

$$p = K [\gamma(h-h_w) + \gamma'h_w + q] + \gamma_w h_w$$

where: p = Lateral earth pressure in kPa acting at depth h
 K = Coefficient of Lateral Earth Pressure

- h = the depth below the ground surface (m)
 h_w = the depth below the ground water level (m)
 γ = the bulk unit weight of soil, (kN/m^3) use 19.5 (average)
 γ' = the submerged unit weight of the exterior soil, ($\gamma - 9.8 \text{ kN/m}^3$)
 q = equivalent value of surcharge on the ground surface in kPa (min 12 kPa)

Where the backfill against the buried structure can be drained effectively to eliminate hydrostatic pressures on the wall, this equation can be simplified to:

$$p = K(\gamma h + q)$$

Assuming a flat surface on top of the retaining structure will be behind, the coefficients for lateral earth pressure (K) estimated to be applicable for design are as follows:

Lateral Earth Pressure Coefficient at rest (K_o):	0.5
Active Earth Pressure Coefficient (K_a):	0.33
Passive Earth Pressure Coefficient (K_p):	3.0

Wall friction should be considered negligible.

For sliding check:

Friction Coefficient Concrete-Soil (f):	0.35
---	------

For a global stability check:

$$\begin{aligned}\phi &= 30^\circ \\ c &= 0 \\ \gamma &= 19.5 \text{ kN/m}^3\end{aligned}$$

Design calculations should be submitted to this office for geotechnical review.

5.2 FLOOR SLABS AND PERMANENT DRAINAGE

The slab-on-grade for the proposed building can be adequately supported at grade. Any exposed soil subgrade must be proof-rolled to detect any soft or unstable areas, which must be removed and replaced with suitably compacted engineered fill, as defined in Section 5.3.3 of this report. Once the required subgrade has been developed, Soil Probe recommends that the exposed

subgrade be inspected and approved by the Geotechnical Engineer prior to the placement of any granular fill or concrete.

It is considered by Soil Probe that completed excavations for floor slabs should not to be left open before pouring concrete for any period longer than 72 hours, particularly if the floor construction works are being completed during the winter months or wet weather periods. The base of any floor slab excavation that is to be left exposed for longer than 72 hours should be suitably covered and protected from water ponding, and/or protected to prevent degradation of the exposed founding stratum with the construction of a mud mat.

Though groundwater was encountered during the investigation, the depth to any stabilized groundwater table at the site is below the deepest level of excavation anticipated by this report (approximate Geodetic elevation 188.3 m). In addition, while the sandy nature of the native soil allows the movement of water around the foundations of the proposed structure, the native soil is not sensitive to the presence of water. It is therefore recommended by Soil Probe that perimeter drainage is installed to control water flow beneath the structure. Typical drainage details for slab-on-grade structures are presented on Figure 8.

In addition, it is recommended that floor slabs are cast on top of a moisture barrier comprising at least 200 mm of 19 mm clear stone. The installation of a moisture barrier beneath the floor slab is considered appropriate as the native soils at the site can hold significant volumes of water.

The design of the concrete slabs on native soils may be made on the basis of a value of modulus of subgrade reaction of 30 MPa/m on the surface of the granular moisture barrier. It is assumed that the Transplant Greenhouse will be heated through winter seasons.

The floor slab should be structurally independent from any load bearing structural elements.

5.3 EXCAVATION AND BACKFILL

5.3.1 Excavatability

Based on the findings of the investigation, it is considered that excavation of the overburden native soils at the site can be carried out using a conventional backhoe excavator.

5.3.2 Excavations

Given the layout of the proposed development in relation to the site area, it has been assumed that all excavations will be open cut. In order to enable entry into excavations

during the construction process, all excavations must comply with the definitions prescribed by the “*Occupational Health and Safety Act*” (OHS), Ontario Regulation 213/91 “*Construction Projects*”.

As defined by the OHS, the native cohesionless soils can be classified as “*Type 3*” soils, being generally “*compact to loose*”, and having a generally “*low degree of internal strength*”. Based on these definitions, excavation walls within these soils will require battering back at slopes no steeper than 1H:1V. During work excavations, adjacent existing structures must be protected by proper shoring or sloping. This should be verified by the Geotechnical Engineer when large-scale excavation can be observed safely and with ease.

It is assumed that the excavations for foundations and utilities will not be deeper than approximately 3 m depth below existing ground level. Groundwater is reported at a depth of approximately 3.7 m below ground level, and it is therefore considered unlikely that a stabilized groundwater table will be encountered during excavations. However, seepage from fill and native soils should be expected, and will likely be controlled by the use of conventional pumping from collection sumps and ditches.

The native cohesionless deposits that are anticipated at the subgrade elevation of the ground floor slab are susceptible to disturbance by construction traffic. Should they become saturated due to rain or failure of perimeter dewatering system, they can be protected by 200 mm construction mat consisting of 50 mm Crusher Run Limestone under the floor slab.

5.3.3 Engineered Fill

The native soils are considered suitable for re-use as fill to backfill excavations, and will be easily excavated using a conventional backhoe excavator.

Consideration may be also given to backfilling excavations with a well graded, compacted granular soil such as Granular B as it, if thoroughly compacted, would reduce the post construction settlements to an acceptable level and may also expedite the compaction process.

Fill materials required for replacing locally softened soils, or raising grades within the footprint of the structures are to comprise suitably organic free materials approved for use by the Geotechnical Engineer. Fill materials are to be placed in lifts of a maximum thickness of 300 mm and compacted, using appropriate compaction equipment, to 98 % of the material’s Standard Proctor Maximum Dry Density (herein “*SPMDD*”).

Fill located in areas outside of the footprint of any proposed structure or roadway should be compacted to at least 95 % of the material's SPMDD to within 1.0 m of the subgrade level, and then to 98 % of its SPMDD up to the required grade. Imported granular fill used in confined areas should be compacted using only hand held compaction equipment only.

Soil Probe recommends that any and all engineered subgrades beneath proposed structures are to be inspected and/or proof rolled prior to construction.

5.4 UTILITY AND SERVICE INSTALLATION CONSIDERATIONS

As per information provided it is understood that, as a part of the proposed development, a network of utility trenches will be excavated for the site servicing. However, the invert elevations, and therefore excavation depths, were not available at the time of authoring this report. In order to provide the following recommendations it has therefore been assumed that any utility or service trenches are to be excavated to a maximum depth of 3.0 m below existing grade, or within engineered fill where grades have been raised sufficiently above the current ground level. Excavations that are to extend deeper than 3.0 m below the existing grade will require further geotechnical assessment by Soil Probe prior to their undertaking.

Existing fill was encountered during the borehole drilling to a maximum depth of approximately 1.7 m below the existing ground level. At locations where unsuitable fill or native soils extend below the pipe invert, this material should be removed and replaced by engineered fill to reduce the risk of settlement. Accordingly, based on the groundwater condition, soil condition and availability of space, different methods for installation of the storm/sanitary sewers and water mains may be selected, as discussed in Sections 5.4.1 and 5.4.2.

5.4.1 Open Cut Trenching

The excavated materials are expected to consist of fill and native soils. As such, it is anticipated that the excavations can be completed, for the most part, with hydraulic backhoes.

For design purposes, the groundwater levels and elevation presented in Table 2 are to be taken into consideration for all open cut excavations.

Where space permits, the excavations could be carried out without support. However, groundwater seepage (if any) and runoff will cause sloughing and ravelling conditions, within a relatively short period of time, in the fill as well as the fine sand materials.

Therefore, the length of any trench opened at any one time should be limited to two (2) to four (4) pipe lengths. These limitations on length can be adjusted during construction, based on the behaviour of the soils. It should be noted that excavation safety and stability of temporary construction slopes and lateral support systems are the contractor's responsibility.

Where space is limited, such as adjacent to existing structure footings, or where less stable conditions are encountered, the sides of the excavation should be supported with braced sheeting or a trench box, as discussed in Section 5.4.2.

In the planning of the trenches' shoring and excavation, the presence of the adjacent structures, existing foundations and buried service pipes (if any) should be considered. In addition to the stability of these existing adjacent structures, which must be maintained without detrimental settlements, the backfill in these trenches and especially the granular bedding surrounding the existing foundations, pipes, manholes, etc. may be a source of water, which, if encountered, must be dealt with.

Therefore, it is considered prudent to open the trenches in relatively short sections and carry out the laying of the pipe and backfilling in a timely manner in order to reduce the length of time the trench would be open.

5.4.2 Trench Boxes and Utility Trench Wall Support

Where permissible under the OSHA, contractors often use trench boxes for temporary trench support. While in many situations the use of trench boxes can result in a high rate of productivity in trenching, it is not without some technical drawbacks. These include:

- Increased loss of ground relative to many other shoring methods; and,
- Reduced ability to compact backfill between the trench wall and trench box.

Ground loss, ravelling and/or loosening of soils will occur when using a trench box prior to its installation and while moving the box, particularly in the looser and softer fill and native soils present at shallow depths at this site.

It is important that the trench is not over-excavated to ensure a tight fit between the box and the trench walls. Trench boxes need to be installed expediently. When moving the box, the void space between its outer walls and the trench must be backfilled and compacted. This may require raising the box sequentially prior to sliding it laterally. If this is not done, post-construction settlements will occur along the trench walls.

5.4.3 **Bedding**

Generally the sandy soils will provide adequate support for the proposed utility pipes and will allow the use of normal Class B type bedding. However, the bedding should conform to current OPSS requirements or any municipal codes.

It should be noted that fine sand material with a tendency to dilate were encountered in some of the boreholes. Such materials are highly susceptible to disturbance due to construction activities and water seepage. Care should be taken during excavation and construction to minimize disturbances of the subgrade soils. If the pipes are laid on the dilated soil, then large post-construction settlements of the pipes can be expected. In order to maintain excavation stability and to prevent dilatancy, trafficking on exposed subgrades should be minimized.

It is recommended the subgrade be observed and approved by a representative of Soil Probe prior to placement of bedding material to confirm that the subgrade conditions are consistent with the recommendations given in this report. Where unsuitable subgrade conditions are observed remedial procedures can be established in the field to avoid construction delays.

Where the subgrade consists of cohesionless soils such as those sands encountered beneath the site, and to avoid the loss of soil fines from the subgrade, uniformly graded clear stone should not be used (provided the subgrade materials are capable of proper filtration) unless, below the granular bedding material, a suitable, approved filter fabric (geotextile) is placed. The geotextile should extend along the sides of the trench and should be wrapped all around the poorly graded bedding material.

The recommended minimum thickness of granular bedding below the invert of the pipes is 150 mm. The thickness of the bedding may, however, have to be increased depending on the pipe diameter, subgrade materials and conditions and/or aforementioned specifications. In addition, where the subgrade is wet or relative weak, the minimum bedding thickness should be increased, subject to an inspection by the Geotechnical Engineer.

The bedding material should consist of well graded granular material such as Granular 'A' or equivalent. After installing the pipe on the bedding, a granular surround of approved bedding material, which extends at least 300 mm above the obvert of the pipe, should be placed.

5.4.4 Backfilling of Trenches

Based on visual and tactile examination, the on-site excavated, organic-free native deposits, can generally be re-used as backfill in the service trenches provided their moisture contents at the time of construction are at or near optimum.

The degree of compaction of the trench backfill should be at least 95 % of the material's SPMDD. This value should be increased to at least 98 % of its SPMDD within 1.5 m of the finished grade. The backfill material should be placed in shallow loose lifts (200 mm to 300 mm thickness). Any overlying granular sub-base and base materials should be compacted to 100 % of their respective SPMDD.

Unsuitable materials such as organic soils, boulders, cobbles, frozen soils, etc. should not be used for backfilling.

In areas where surface settlements can be tolerated, such as in landscaped areas, a compaction degree in the order of 92 % if its SPMDD may be sufficient.

The on-site excavated soils should not be used in confined areas (e.g. around catchbasins and laterals under roadways) where heavy compaction equipment cannot be operated. The use of imported granular fill together with an appropriate frost taper would be preferable in confined areas and around structures, particularly around catchbasins.

5.5 CONSTRUCTION CONSIDERATIONS

5.5.1 Site Preparatory Works

The site preparation work should include stripping of all topsoil and fill (ploughed soil) in order to develop the required construction or engineered fill subgrades. Stripping depths will likely vary locally and should be adjusted to remove all unsuitable material.

It is recommended that the Geotechnical Engineer monitors the stripping operations to ensure that unsuitable materials have been fully removed prior to construction works or the placement of engineered fill. Unacceptable areas identified are to be remediated as soon as practicable, the procedures for which would be dependent upon conditions encountered. This could include additional undercutting of unsuitable materials and replaced with controlled, engineered fill as prescribed in Section 5.3.3 of this report.

5.5.2 Vibration Monitoring

Ground vibrations generated because of construction related activities must be monitored to ensure that they do not exceed the safe limits, which have the potential to cause adverse impact and structural damage, particularly to the adjacent sensitive glass structures, through ground settlement and/or by subjecting the existing structures/underground services to excessive vibration.

5.5.3 Stockpile Management

At the time of construction, consideration should be given towards how excavated materials are stored on site between their excavations and re-use. Exposed, excavated soil stockpiles that have been assessed for re-use as engineered fill on site should be compacted at the surface or temporarily covered during wet weather to help maintain their original moisture content. Such stockpiles are prone to wet weather exposure and, as such, the increased moisture contents will make these materials too wet to achieve the required levels of compaction.

Conversely, the native soils to be excavated at the site are sufficiently fine grained to dry out during hot, dry periods, and the decreased moisture contents will make these materials too dry to achieve the required levels of compaction. Therefore, some moisture addition/conditioning by means of water hosing or misting should be expected if the trench excavation works are to be undertaken during the summer months.

Consideration should be also given to the separate stockpiling of excavated materials during the excavation process to ensure that the excavated material is re-used to its maximum potential.

Stockpiles are to be placed well away from the edge of any excavation, and their height should be limited so that they do not surcharge the sides of the excavation. Surface drainage should be also controlled to minimise the flow of surface water into the excavations. It should be noted that excavation safety and stability of temporary construction slopes and lateral support systems are the contractor's responsibility.

5.5.4 General Considerations

Load bearing soils are susceptible to disturbance from environmental (temperature, moisture change, etc.) and construction activity and, as such, due care should be given to minimising trafficking of such areas during periods of excavation and the construction of floor slab and footings to minimize disturbance of the bearing soils.

Any excessive disturbances of the load bearing and underlying soils affected during construction works could influence the long term settlement of the structures and will therefore require further excavation and replacement of such impacted soils with suitably engineered fill.

A representative of Soil Probe should evaluate all subgrade surfaces to confirm that the subgrade and founding conditions are consistent with the recommendations given by this report.

5.6 PAVEMENT CONSIDERATIONS

5.6.1 Preparatory Considerations

As part of the preparatory works for any new roadway areas, all existing fill materials or native soils should be profiled to develop the required subgrade elevations. Where grades require rising to develop the subgrades, then engineered fill is to be placed and compacted as detailed in Section 5.3.3 of this report.

Should the contractor carry out the job during winter periods, care should be taken to prevent the exposed subgrade soils from freezing temperatures. Should the subgrade be exposed to freezing temperatures, all frozen soil must be removed or fully thawed prior to the next stage of construction.

5.6.2 Roadway Subgrade Considerations

The anticipated excavated subgrades, as identified in the borehole BH1, for the proposed roadway structures comprise generally fill or native loose sand. All subgrades must be proof rolled under the supervision of the Geotechnical Engineer.

It is recommended that, during the construction of the new roadway, the exposed subgrade is inspected by an experienced Geotechnical Engineer prior to placing new granular material in order to remove any soft materials that may present at the developed subgrade elevation.

Any unacceptable areas of subgrade identified during the proof rolling are to be remediated as soon as practicable, the procedures for which would be dependent upon conditions encountered. Such remedial measures could include additional undercutting of unsuitable materials and replacement with controlled, engineered fill as prescribed in Sections 5.3.3 and 5.6.4 of this report.

5.6.3 Roadway Structure Design Considerations

The recommendations for roadway designs are provided Table 3, and are based on an estimate of the subgrade soil condition, as identified at the borehole locations of this geotechnical investigation. The recommended structures should only be considered for preliminary design purposes.

Table 3: Roadway Structure Recommendations

Pavement Layer	Required Level of Compaction	Compacted Thickness
		Light Vehicle
OPSS Granular A	100 % SPMDD*	150 mm
OPSS Granular B	100 % SPMDD*	300 mm
Total Minimum Pavement Depth		450 mm

* Standard Proctor Maximum Dry Density, ASTM-D698

Figure 9 presents a typical cross section for a gravel road pavement construction.

5.6.4 Roadway Construction Considerations

The long term performance of roadway greatly depends upon the support provided by the subgrade. A number of factors should be considered at both design and construction stages to ensure that the optimum subgrade condition for proposed roadway is developed and maintained:

- Any soft areas of notable deflection of the subgrade should be sub-excavated and replaced with an approved backfill compacted to 98 % of its SPMDD;
- The subgrade should be properly shaped, crowned and then proof-rolled under the full time observation of the Geotechnical Engineer;
- Surface water should not be allowed to pond on the surface of or adjacent to the outside edges of any developed subgrade;
- The subgrade should be appropriately protected against freezing during any winter construction;
- Sub-drains should be installed to intercept excess surface moisture that may infiltrate the roadway structure section through the surface and would result in the subgrade softening;
- The location of sub-drainage within the proposed roadway areas should be determined by the Pavement Engineer responsible for the layout of the drainage grades for the

proposed site development, and should be reviewed by Soil Probe in conjunction with the proposed site grading;

- Regular maintenance will be required for the roadway; and,
- The most severe loading conditions on roadway areas and the associated subgrades occur during construction. Consequently, special provisions such as restricted access lanes, half-loads during construction, etc., may be required, especially if construction is carried out during unfavourable weather.

On completion of the subgrade development, the roadway structure construction should be commenced within 24 hours to prevent any degradation to the exposed subgrade, particularly during unfavourable or freezing weather conditions.

All pavement component materials should be produced and laid in accordance with current OPSS requirements. Granular materials are to be compacted to 100 % of their SPMDD. The recommendations provided have assumed that construction will take place under favourable conditions.

In the event that construction takes place in the late fall, the spring thaw, or following a heavy rainfall event, it should be anticipated that an increased thickness of the sub-base layer will be required to compensate for reduced subgrade strength.

5.6.5 Drainage Considerations

All roadway surfaces should be sloped to provide satisfactory drainage towards catch basins. As discussed in the previous sections, by means of good planning any water trapped in the granular sub-base materials should be drained rapidly towards sub-drains or other interceptors with a minimum cross-fall of 2 %. Attention to ensuring the adequacy and efficiency of roadway sub-drains could extend the operational life of the new structure.

5.6.6 Sidewalk and Corridor Design Considerations

The design and construction of any proposed concrete sidewalks and corridors should be completed to the satisfaction of the OPSS, and as detailed in Table 4 and the concrete and aggregates should be produced and placed to meet those standards.

It should be noted that the concrete sidewalk and corridor design specified in the following Table 4 addresses a use by pedestrian traffic only and does not include for use by vehicular traffic.

Table 4: Minimum Concrete Sidewalk and Corridor Specifications

Materials	Specific Requirements	Layer Thickness
Normal Portland GU (30 MPa) (CAN3-CSA A23.1)	7 % air entrainment ± 1.5 %	Standard: 125 mm At driveways: 150 mm**
OPSS Granular A	Compaction to 100 % SPMDD*	100 mm

* Standard Proctor Maximum Dry Density

**Sidewalks through commercial or industrial driveways are to be reinforced with 152 x 152 MW, 18.7 metric welded wire

To ensure that the finished sidewalk is free of ponding water, a final slope/gradient of the concrete sidewalk surface of at least 2 % should be maintained. In addition, construction joints in the sidewalk concrete should be properly sealed (e.g. bitumen filler) to minimize the water migration, and be formed between every third sidewalk bay.

6.0 MATERIAL TESTING AND INSPECTION

It is recommended that Soil Probe is appointed to carry out field inspection and material testing during construction to ensure that the construction complies with the design recommendations.

7.0 SUBSURFACE UTILITY ENGINEERING INVESTIGATION AND TOPOGRAPHICAL SURVEY

A Subsurface Utility Engineering (SUE) Investigation program was carried out in accordance with the American Society of Civil Engineers (ASCE) Standard 38-02. This standard defines SUE and sets guidance for the collection and depiction of subsurface utility information. The ASCE standard presents a system to classify the quality of existing subsurface utility data, in accordance with four quality levels, identified as Quality Levels A to D, Level A being the most intensive and Level D being the most basic.

Canadian Standards Association (CSA) Standard S250 was also applied as it compliments and extends ASCE Standard 38-02 by setting out requirements for generating, storing, distributing, and using mapping records to ensure that underground utilities are readily identifiable and locatable.

For the purposes of this investigation, an ASCE Quality Level C SUE Investigation was used. This involves surveying visible above ground utility facilities (e.g., manholes, valve boxes, etc.) and correlating this information with existing utility records (QL-D information) (as per RS 2.1.1.B.1 and RS 2.1.1.B.2). Ground Penetrating Radar (or "GPR") methodologies were also adopted to identify major features, including the decommissioned septic tank in the north of the site.

The area of the SUE Investigation was limited to that defined by the attached Drawing SKA-01, as provided to Soil Probe by the PWGSC, and included for those requirements defined by the TOR of Reference RS 2.1.1.B.3 (B) “*Topographic Survey and Subsurface Utility Locations*”.

In conjunction with the SUE Investigation a Topographical Survey was completed targeting the area defined by Drawing SKA-02, and included those features and details defined by the TOR RS 2.1.1.B.3 (B) “*Topographic Survey and Subsurface Utility Locations*”.

Following the completion of the SUE Investigation and Topographical Survey field works, a single Computer Aided Design (CAD) drawing was generated and is included in this report as Drawing 552270. The drawing provides the topographical features of the investigated area with the subsurface utilities overlain.

8.0 DRAWING REVIEW

It is recommended that, once the final design drawings for this project are prepared, one set of the drawings should be submitted to Soil Probe for review to make any amendments to our recommendations that may be required, prior to starting construction.


Soil Probe should also be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, Soil Probe will assume no responsibility for interpretation of the recommendations in this report.

The comments given in this report are preliminary and intended only for the guidance of design engineers. Contractors bidding on or undertaking the works should make their own interpretations of the factual borehole results, so that they may draw their own conclusions on to how the subsurface conditions may affect them.

The information in this report in no way reflects on the environmental aspects of the soil conditions at the site and has not been addressed in this report, since this aspect was beyond the scope and terms of reference.


9.0 CLOSURE

This report is subject to the *Statement of Limitations* which forms an integral part of this document. The *Statement of Limitations* is not intended to reduce the level of responsibility accepted by Soil Probe, but rather to ensure that all parties who have been given reliance for this report are aware of the responsibilities each assumes in so doing.




We trust that this report meets your needs. Should you have any queries, please contact the Soil Probe office.

Sincerely,
SOIL PROBE LTD.



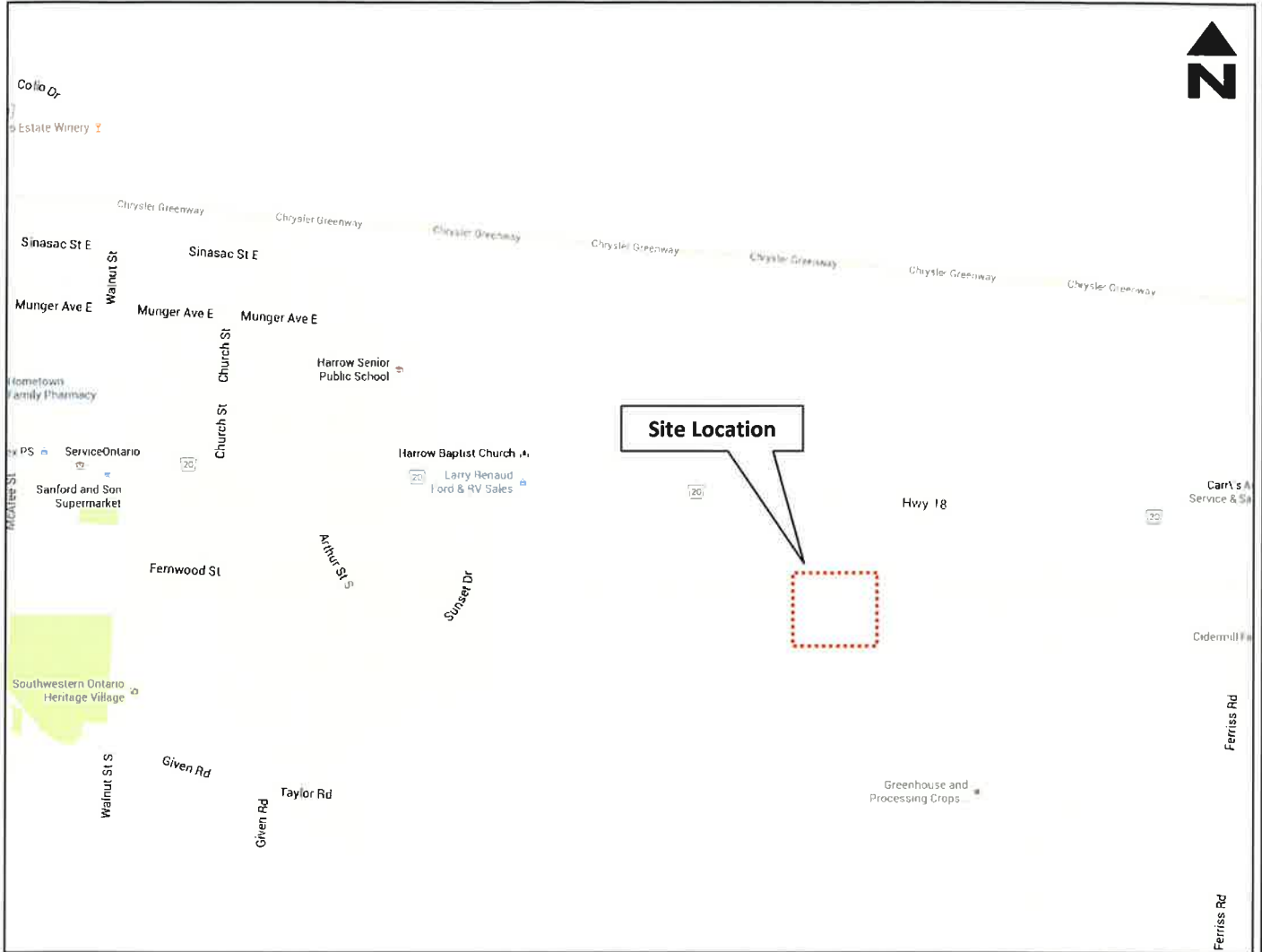
Samuel Pena, P.Eng.




Bill Feng, P.Eng.

SP\sp-jd-nh\SHARE15\SRP 2015\SP-3556-27874-PWGSC-2585 County Road, Harrow-Oct 2015

FIGURES



 SOIL PROBE	SITE LOCATION PLAN	Figure No.: 1
	GEOTECHNICAL INVESTIGATION Proposed New Transplant Greenhouse 2585 County Road 20, Harrow, Ontario	
Date: October 13, 2015	PWGSC Project No. R.073376.001	Not to Scale
Report Number: 2015-27874		
File No.: SP-3556		



PHOTOGRAPH 1: BH1 location looking east




PHOTOGRAPH 2: BH2 location looking east

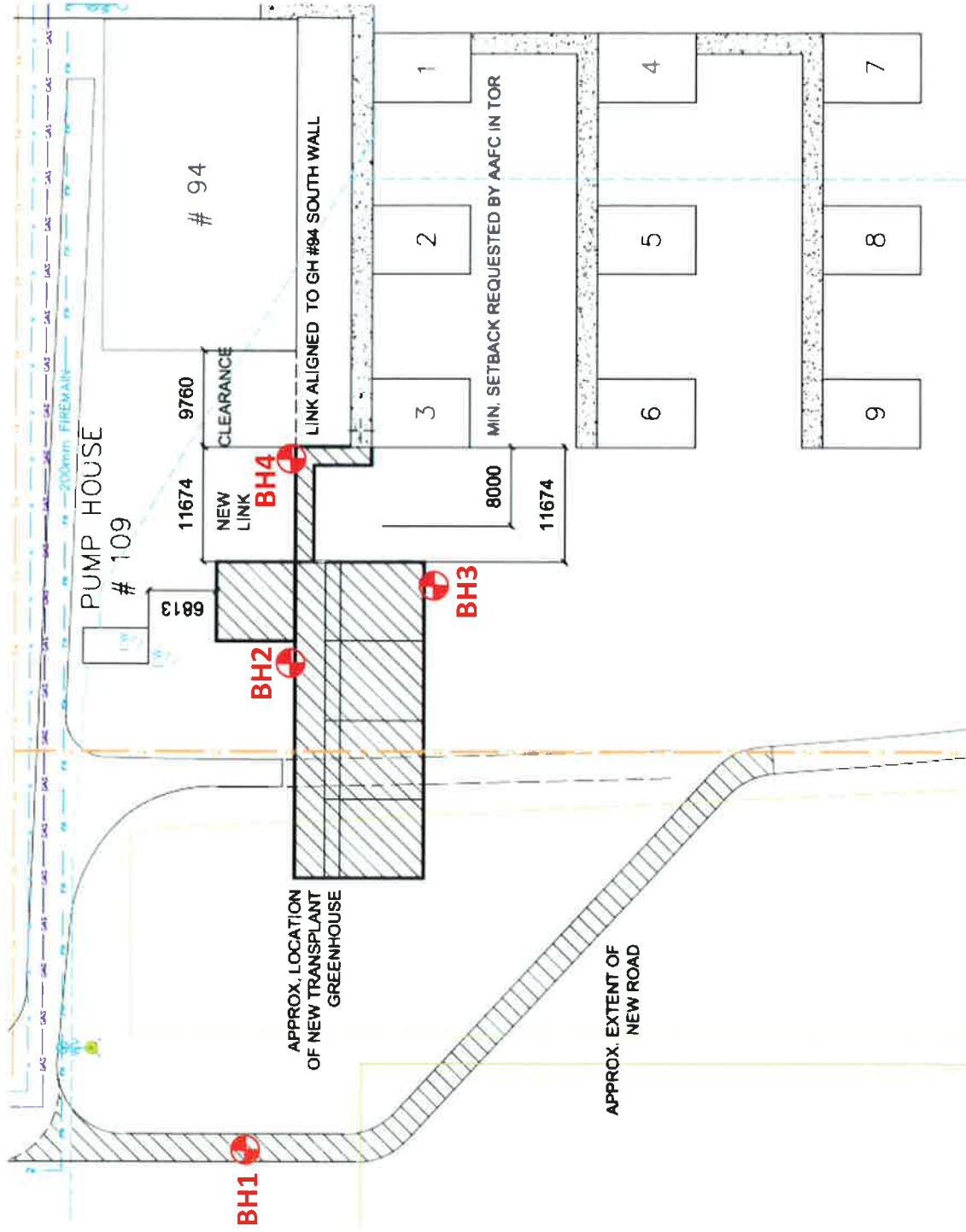


PHOTOGRAPH 3: BH3 location looking east



PHOTOGRAPH 4: BH4 location looking east

 SOIL PROBE	SITE PHOTOGRAPHS	Figure No.: 2
Date: October 13, 2015 Report Number: 2015-27874	GEOTECHNICAL INVESTIGATION Proposed New Transplant Greenhouse 2585 County Road 20, Harrow, Ontario	
File No.: SP-3556	PWGSC Project No. R.073376.001	Not to Scale



KEY:
 Borehole



Date: October 13, 2015

Report Number: 2015-27874

File No.: SP-3556

BOREHOLE LOCATION PLAN

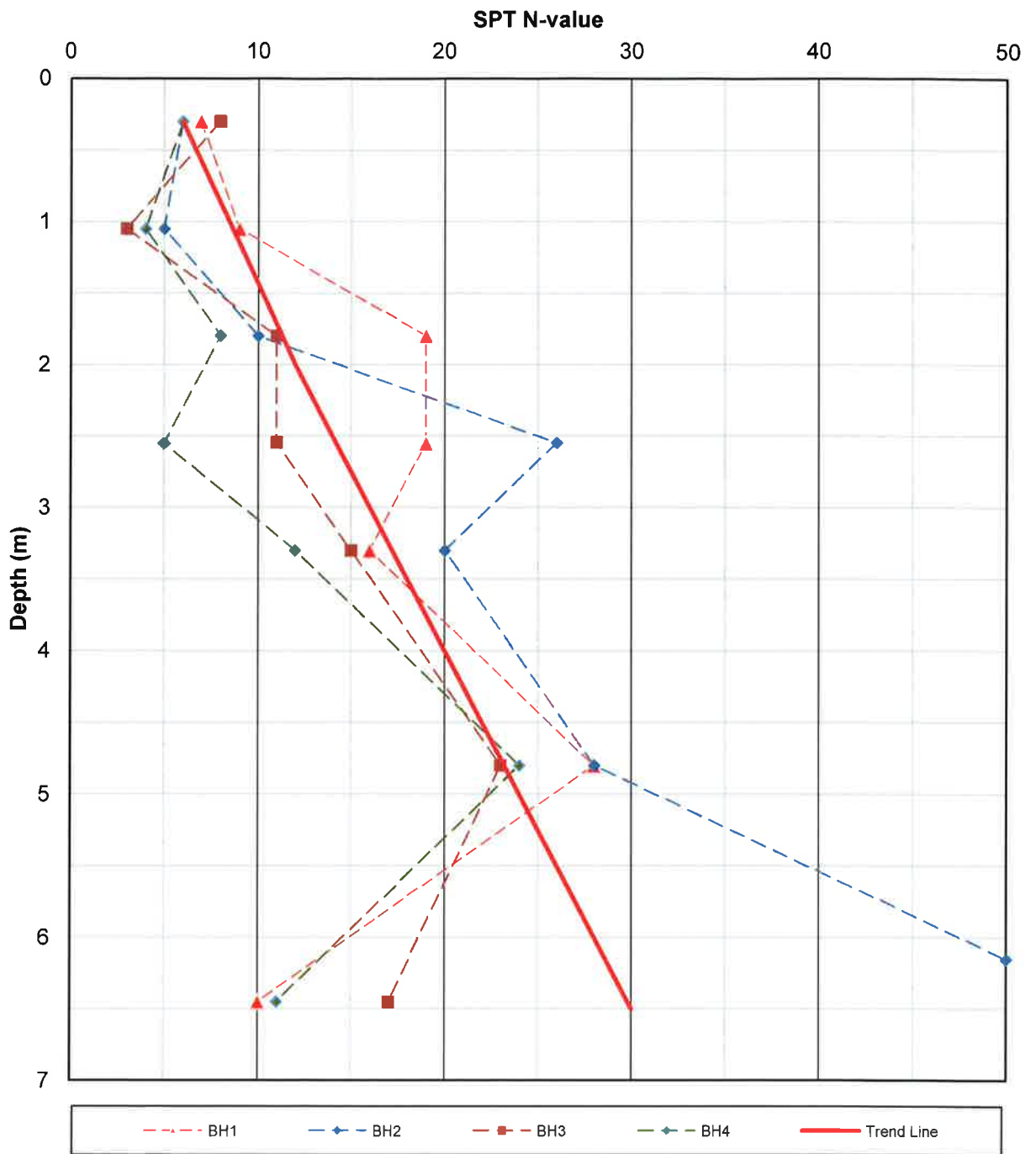
GEOTECHNICAL INVESTIGATION
 Proposed New Transplant Greenhouse
 2585 County Road 20, Harrow, Ontario

PWGSC Project No. R.073376.001

Figure No.:

3

Not to Scale



Date: October 13, 2015

Report Number: 2015-27874

File No.: SP-3556

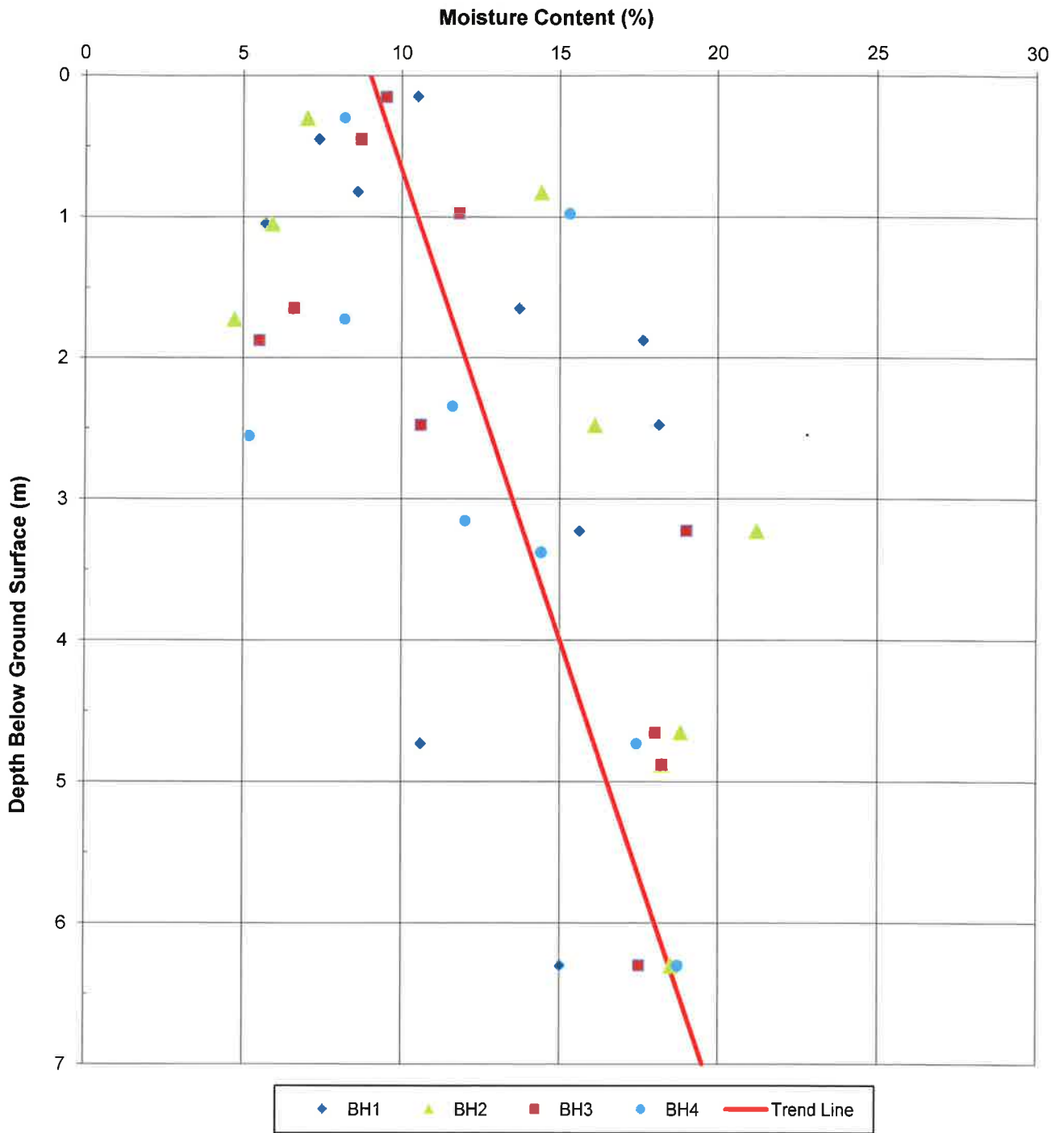
SPT N-value Profiles

GEOTECHNICAL INVESTIGATION
 Proposed New Transplant Greenhouse
 2585 County Road 20, Harrow, Ontario

PWGSC Project No. R.073376.001

Figure No.:

4



Date: October 13, 2015
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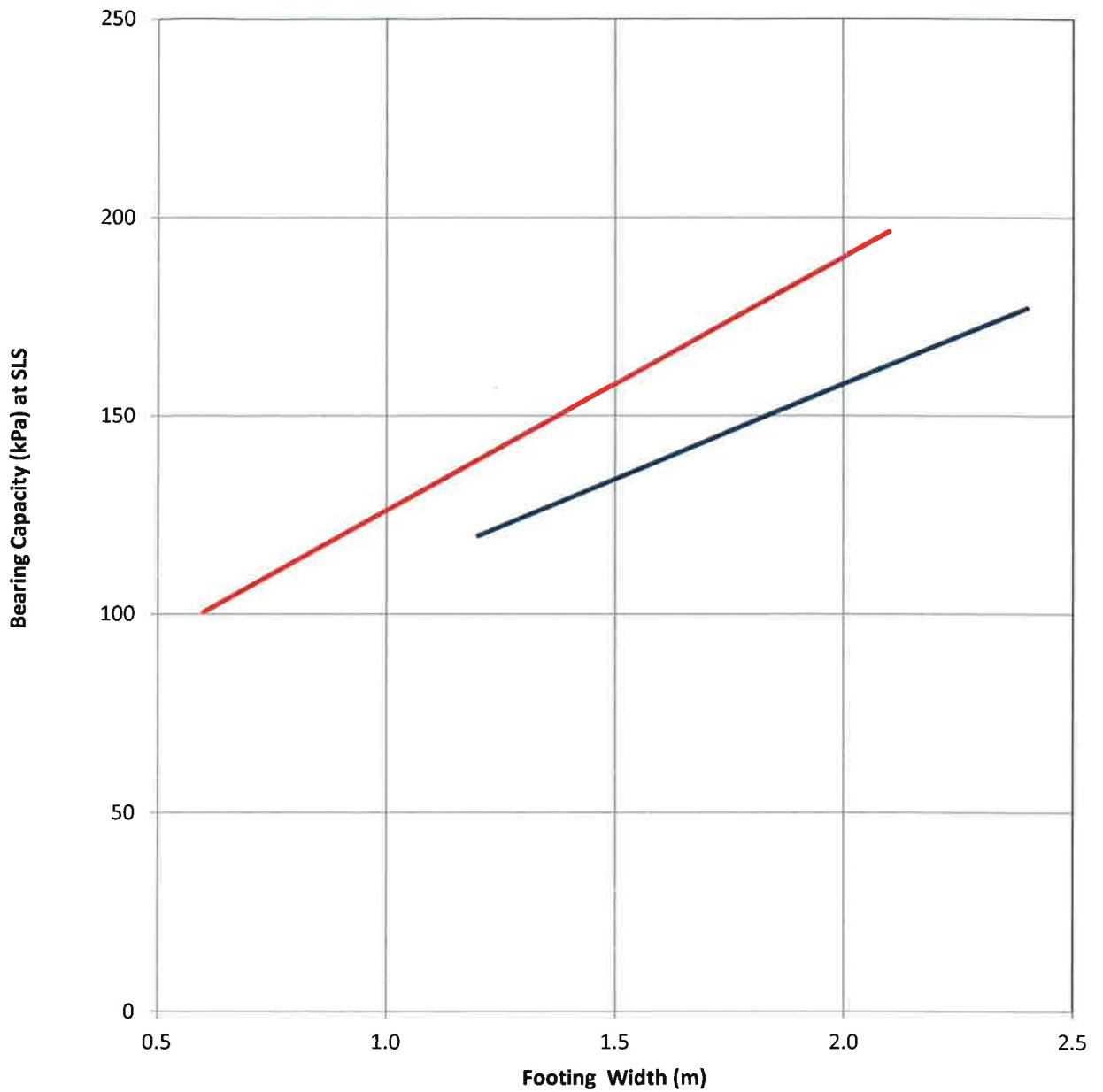
Moisture Content Profile

GEOTECHNICAL INVESTIGATION
 Proposed New Transplant Greenhouse
 2585 County Road 20, Harrow, Ontario


PWGSC Project No. R.073376.001

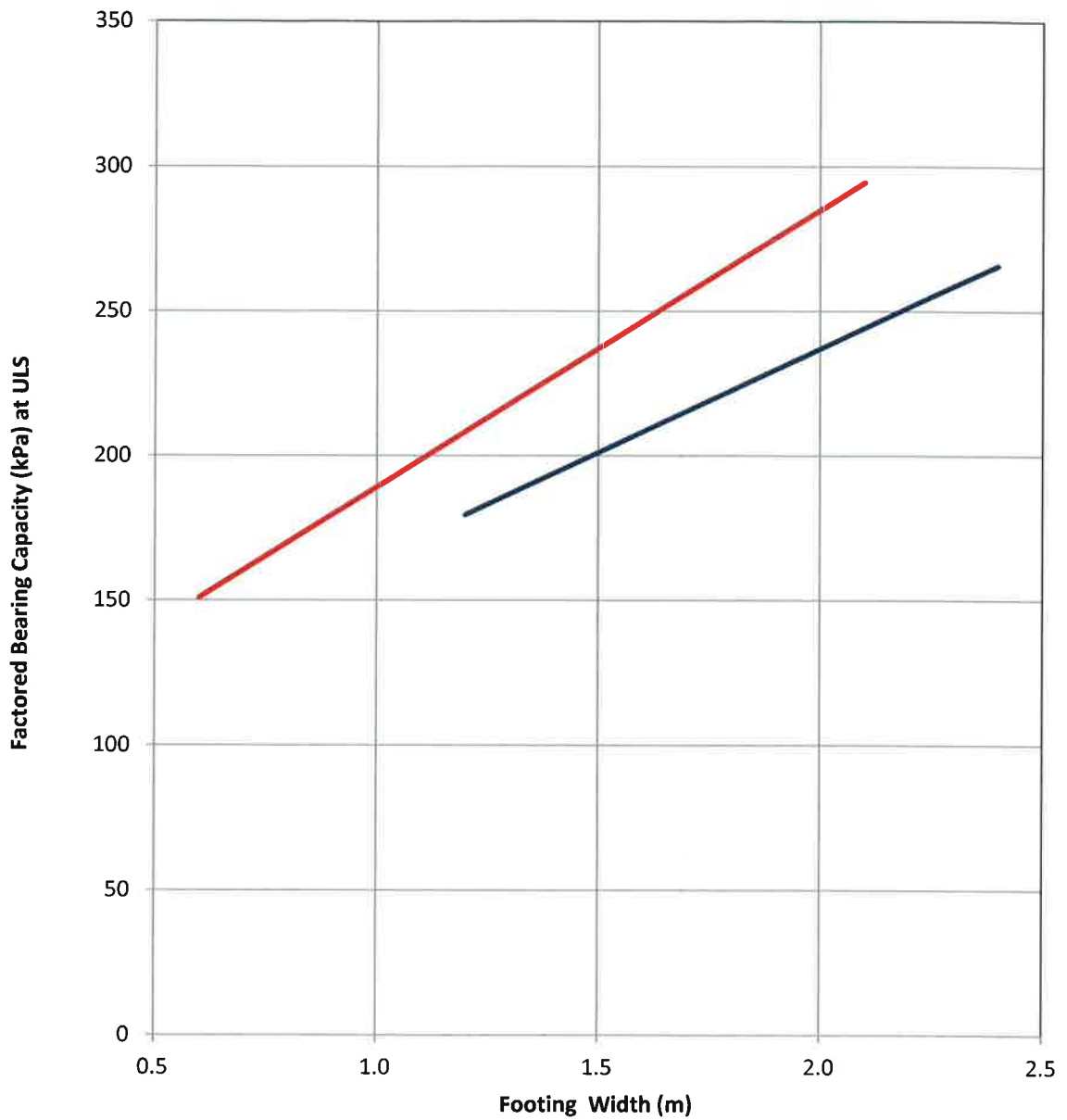
Figure No.:

5



— Strip Footing — Square Footing

	Bearing Capacity at SLS for Strip and Spread Footing	Figure No.: <h1 align="center">6</h1>
	GEOTECHNICAL INVESTIGATION Proposed New Transplant Greenhouse 2585 County Road 20, Harrow, Ontario	
	PWGSC Project No. R.073376.001	
	Date: October 13, 2015 Report Number: 2015-27874 File No.: SP-3556	



— Strip Footing — Square Footing



Factored Bearing Capacity at ULS for Strip and Spread Footing

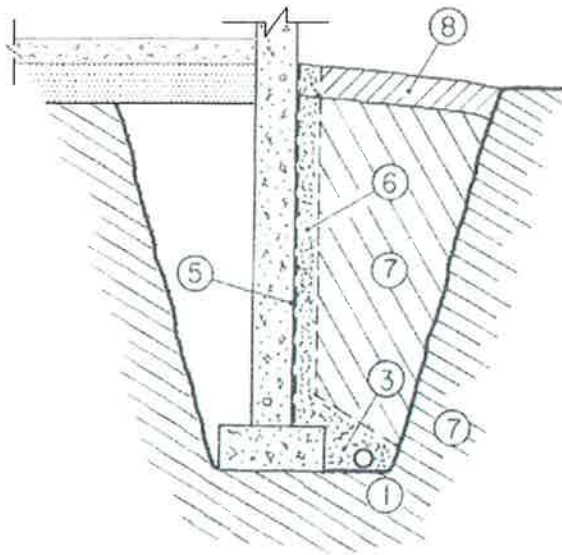
Date: October 13, 2015
 Report Number: 2015-27874
 File No.: SP-3556

GEOTECHNICAL INVESTIGATION
 Proposed New Transplant Greenhouse
 2585 County Road 20, Harrow, Ontario

PWGSC Project No. R.073376.001

Figure No.:

7




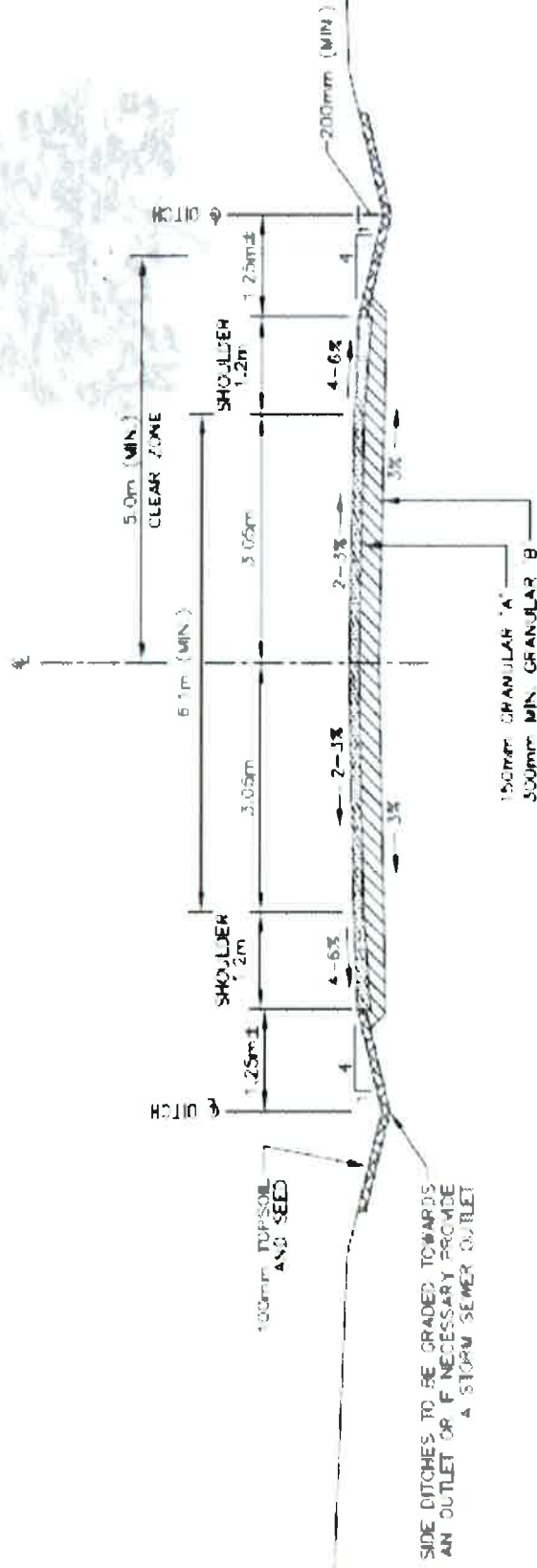
- ① 100 mm, perforated or slotted pipe placed below the upper level of the floor slab;
- ② Filter material that is compatible with the grain size characteristics of the fine grained foundation and backfill soils, as well as with the perforations of the pipe;
- ③ Filter material continuously or intermittently placed next to the foundation wall to intercept water draining from window wells, down exterior walls and from low areas near the building;
- ④ Damp-proofing on wall – optional depending on the quality of the concrete wall;
- ⑤ Optional use of sheet drain, or synthetic fire blanket, next to the foundation wall to replace the soil filter according to ④;
- ⑥ Backfill soils to exterior of foundation, which may contain fine grained and erodible materials;
- ⑦ Native soils; and,
- ⑧ "Topping off" material is to be graded such that it slopes outwards to lead surface water away from the building. It is usually desirable to use low permeability topsoil to reduce the risk of overloading the drainage pipe.

Based on Figure 12.1, Canadian Foundation Engineers Manual, Fourth Edition, 2006.

Additional Notes:

1. The perforated or slotted drainage pipe is to lead to a positive drainage sump or outlet. The invert of the pipe is to be a minimum of 150 mm below the underside of the proposed floor slab;
2. Backfill materials to the interior of the foundation walls may be clean, organic-free soils that can be compacted to the specified density within in a confined space;
3. Heavy, vibratory compaction equipment should not be used within 450 mm of the foundation wall. Fill is not to be placed or compacted within 1.8 m of the wall unless fill is being placed simultaneously on both sides of the wall;
4. The moisture barrier beneath the floor slab is to comprise at least 200 mm of compacted 19mm clear stone or an equivalent free-draining material;
5. Should the 19 mm clear stone require surface blinding then 6 mm stone chips are to be used; and,
6. The slab on grade should not be structurally connected to the foundation wall or footing.

 SOIL PROBE	GENERAL REQUIREMENTS FOR DRAINAGE TO SLAB- ON-GRADE STRUCTURES	Figure No.: 8
	GEOTECHNICAL INVESTIGATION Proposed New Transplant Greenhouse 2585 County Road 20, Harrow, Ontario	
	Date: October 13, 2015 Report Number: 2015-278747 File No.: SP-3556	PWGSC Project No. R.073376.001



SIDE DITCHES TO BE GRADED TOWARDS AN OUTLET OR IF NECESSARY PROVIDE A STORM SEWER OUTLET



Date: October 13, 2015

Report Number: 2015-27874

File No.: SP-3556

TYPICAL CROSS SECTION GRAVEL ROADWAY

GEOTECHNICAL INVESTIGATION
 Proposed New Transplant Greenhouse
 2585 County Road 20, Harrow, Ontario

PWGSC Project No. R.073376.001

Figure No.:

9

Not to Scale

APPENDIX A

Geotechnical Investigation Borehole Logs

BOREHOLE LOG

BOREHOLE NO.: 1



PROJECT NO.: SP-3556 **DATE:** September 18, 2015
PROJECT: New Transplant Greenhouse, PWGSC Project No.: R.073376.001

CLIENT: Public Works and Government Services Canada - Ontario Region
LOCATION: 2585 County Road 20, Harrow, N0R 1G0, Ontario, Canada
ELEVATION (M): 191.89 **CAVED AT DEPTH (M):** 5.72
WATER LEVEL DEPTH (M): 3.86 **DRILLING METHOD:** Solid Stem Auger
DRILLER: Sundin's Well Drilling Ltd **DRILL RIG:** CME-55 Truck Mounted
LOGGED BY: Aiyadurai Kanesanathan (Ken) **REVIEWED BY:** Samuel Pena

LEGEND:	
	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	STABILIZED WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEVATION/ DEPTH (m)	WELL/ PIEZO DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	DESCRIPTION	O.V.M	M.C.	STANDARD PENETRATION TESTS		ELEVATION/ DEPTH (m)	P.L.-L.L.	
						BLOW COUNTS	"N" VALUE		△ M.C.	● "N" Value
0			TOPSOIL					0		
191.1		1	SILTY SAND FILL- trace gravel, red/ brown, damp, loose		7.4 10.5	2-4-3-4	7	191.1		
1.3		2			8.6 5.7	2-3-6	9	1.3		
189.8		3	SAND - trace silt, medium grained, brown/light brown, damp, becoming wet, compact		13.7 17.6	5-9-10	19	189.8		
2.6		4			18.1	6-9-10	19	2.6		
188.5		5			15.6	4-7-9	16	188.5		
3.9								3.9		
187.2		6	SAND - some gravel, trace silt, brown, wet, compact		10.6	5-13-15	28	187.2		
5.2								5.2		
185.9		7			15.0	2-4-6-8	10	185.9		
6.5			End of borehole at 6.71 m					6.5		
184.6			Borehole open and dry on completion of drilling					184.6		
7.8								7.8		
183.3								183.3		
9.1								9.1		
182								182		

Notes:

KEY TO SYMBOLS

Enclosure No.: 5
Report No.: 2015-27874
File No.: SP-3556

Symbol Description

Symbol Description

Strata symbols

 **Topsoil**

 **Fill**

 **Sand**

Misc. Symbols

 **Stabilized Water Level**

 **Borehole Caved At**

 **Natural Moisture Content**

Soil Samplers

 **Split Spoon**

Monitor Well Details

 **Riser With Cover and Protective Casing**

 **Unknown Backfill Type, Blank PVC**

 **Bentonite Pellets**

 **Silica sand, Blank PVC**

 **Slotted Pipe w/ Sand**

 **No Pipe, Filler Material**

 **End of Well Installation**

Notes:

Terms describing **RELATIVE DENSITY**, based on Standard Penetration Test "N"-Value for **COURSE GRAINED** soils (major portion retained on No. 200 sieve).

DESCRIPTIVE TERM ["N"-Value (blows/0.3m), Relative Density (%)]

- Very Loose [less than 4, less than 15]
- Loose [4 to 10, 15 to 35]
- Compact or Medium [10 to 30, 35 to 65]
- Dense [30 to 50, 65 to 85]
- Very Dense [greater than 50, greater than 85]

Terms describing **CONSISTENCY**, based on Standard Penetration Test "N"-Value for **FINE GRAINED** soils (major portion passing No. 200 sieve)

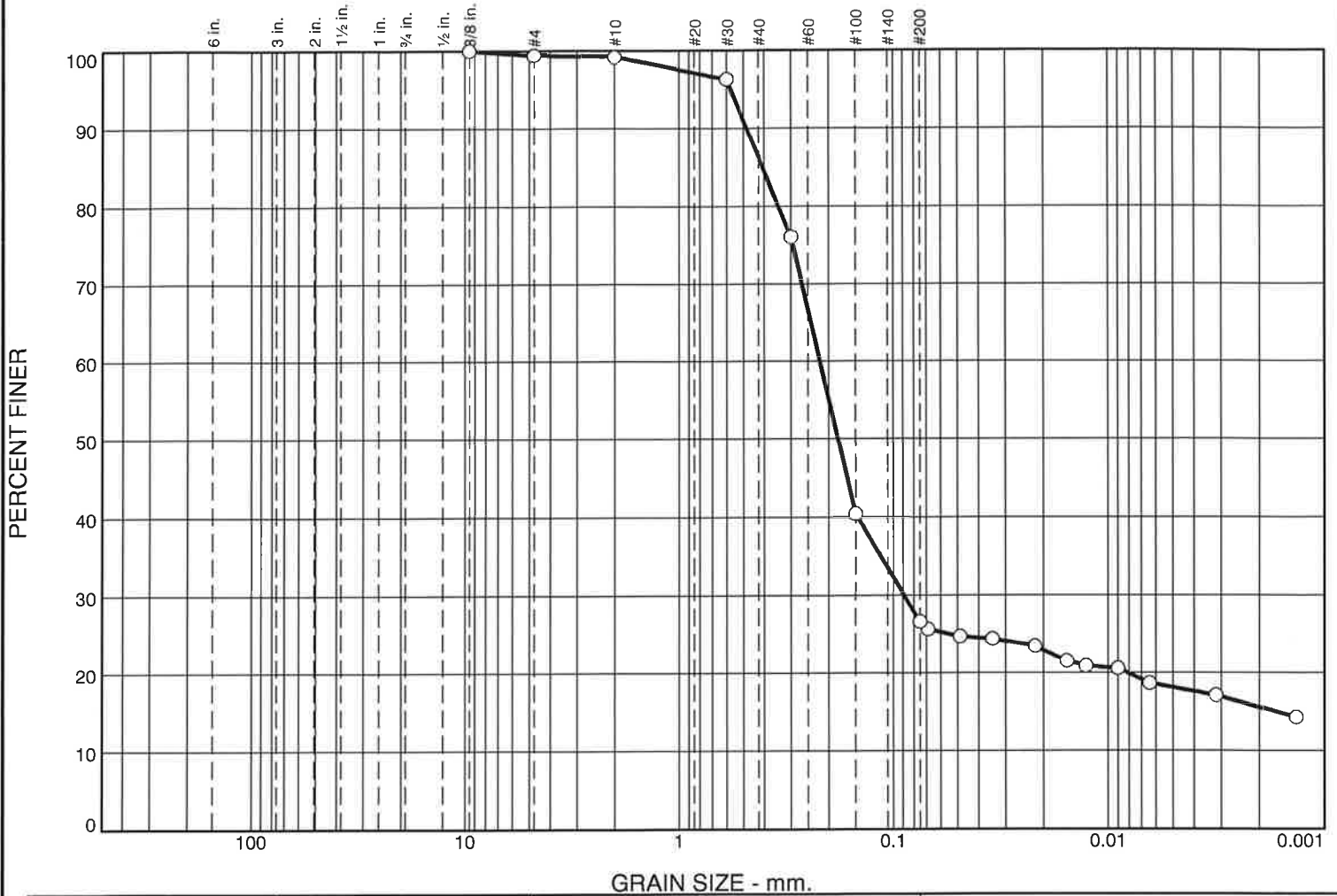
DESCRIPTIVE TERM [Unconfined Compressive Strength (kPa), "N"-Value (blows/0.3m)]

- Very Soft [less than 25, less than 2]
- Soft [25 to 50, 2 to 4]
- Firm [50 to 100, 4 to 8]
- Stiff [100 to 200, 8 to 15]
- Very Stiff [200 to 400, 15 to 30]
- Hard [greater than 400, greater than 30]

APPENDIX B

Geotechnical Laboratory Testing Certificates

Particle Size Distribution Report



GRAIN SIZE - mm.

%	+3"	% Gravel		% Sand			%	Fines			
		Coarse	Fine	Coarse	Medium	Fine					
○	0	0	1	0	13	59	27				
⊗	Colloids	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○				0.4075	0.2196	0.1808	0.0888	0.0017			

Material Description	USCS	AASHTO
○ Silty Sand, trace gravel		

<p>Project No. SP-3556 Client: Public Works and Government Services Canada - Ontario</p> <p>Project: New Transplant Greenhouse (PWGSC Proj. #R.073376.001)-2585 County Rd 20, Harrow,</p> <p>○ Location: BH No.1 Depth: 0.35 m to 0.61 m Sample Number: 15-288</p> <p>Date: ○ September 18, 2015</p>	<p>Remarks:</p> <p>○ Sampled by : Ken</p> <p>On September 18, 2015</p> <p>Report No.:2015-27874</p>
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SOIL PROBE LTD.

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines				
		Coarse	Fine	Coarse	Medium	Fine					
○	0	0	2	7	21	51	19				
□	0	0	1	0	30	59	10				
△	0	0	0	0	18	71	11				
⊗	Colloids	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○				1.1938	0.2828	0.2368	0.1660				
□				0.5325	0.3757	0.3268	0.2189	0.1557			
△				0.4470	0.2782	0.2393	0.1769	0.1065			

Material Description	USCS	AASHTO
○ Sand, some silt, trace gravel □ Sand, trace gravel, trace silt △ Sand, trace silt		

Project No. SP-3556 Project: New Transplant Greenhouse (PWGSC Proj. #R.073376.001)-2585 County Rd 20, Harrow, Location: BH No. 4 Location: BH No. 3 Location: BH NO. 2 Date: ○ September 18, 2015	Client: Public Works and Government Services Canada - Ontario Depth: 1.52 m to 1.98 m Depth: 3.04 m to 3.5 m Depth: 1.52 m to 1.98 m Date: □ September 18, 2015	Sample Number: 15-285 Sample Number: 15-286 Sample Number: 15-287 Date: △ September 18, 2015	Remarks: ○ Sampled by : Ken On September 18, 2015 Report No.: 2015-27874 □ Sampled by : Ken On September 18, 2015 Report No.:2015-27874
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SOIL PROBE LTD.

APPENDIX C

Subsurface Utility Engineering Investigation and Topographical Survey Drawing



211 Terry Road, Unit 6, Ancaster, Ont. L9G 3L7
 Phone: (905) 444-3344
 Fax: (905) 444-3372

PROJECT NO.	552270	DATE	08/30/2015	DRAWN/CHECKED BY	ADP/
SCALE	AS SHOWN	PROJECT	SOIL PROBE	CLIENT	2885 COUNTY ROAD 20, HARROW, ONT

2885 COUNTY ROAD 20, HARROW, ONT

UTILITY CODES

--- Water Line
 --- Gas Line
 --- Sewer Line
 --- Electric Line
 --- Telephone Line
 --- Cable TV Line
 --- Fire Alarm Line
 --- Fire Sprinkler Line
 --- Fire Alarm/Telephone Line (FATL)
 --- Fire Alarm/Telephone Line (FATL) - 100mm
 --- Fire Alarm/Telephone Line (FATL) - 150mm
 --- Fire Alarm/Telephone Line (FATL) - 200mm
 --- Fire Alarm/Telephone Line (FATL) - 250mm
 --- Fire Alarm/Telephone Line (FATL) - 300mm
 --- Fire Alarm/Telephone Line (FATL) - 350mm
 --- Fire Alarm/Telephone Line (FATL) - 400mm
 --- Fire Alarm/Telephone Line (FATL) - 450mm
 --- Fire Alarm/Telephone Line (FATL) - 500mm
 --- Fire Alarm/Telephone Line (FATL) - 550mm
 --- Fire Alarm/Telephone Line (FATL) - 600mm
 --- Fire Alarm/Telephone Line (FATL) - 650mm
 --- Fire Alarm/Telephone Line (FATL) - 700mm
 --- Fire Alarm/Telephone Line (FATL) - 750mm
 --- Fire Alarm/Telephone Line (FATL) - 800mm
 --- Fire Alarm/Telephone Line (FATL) - 850mm
 --- Fire Alarm/Telephone Line (FATL) - 900mm
 --- Fire Alarm/Telephone Line (FATL) - 950mm
 --- Fire Alarm/Telephone Line (FATL) - 1000mm

CONTOURS
 Contour intervals are as follows:

Subsurface Utility Engineering Quality Levels
 (ASCE 38-02)

CLX - Utility location and depth using
 CLY - Utility location and depth using
 CLZ - Utility location and depth using
 CLW - Utility location and depth using
 CLV - Utility location and depth using
 CLU - Utility location and depth using
 CLT - Utility location and depth using
 CLS - Utility location and depth using
 CLR - Utility location and depth using
 CLQ - Utility location and depth using
 CLP - Utility location and depth using
 CLN - Utility location and depth using
 CLM - Utility location and depth using
 CLL - Utility location and depth using
 CLK - Utility location and depth using
 CLJ - Utility location and depth using
 CLI - Utility location and depth using
 CLH - Utility location and depth using
 CLG - Utility location and depth using
 CLF - Utility location and depth using
 CLE - Utility location and depth using
 CLD - Utility location and depth using
 CLC - Utility location and depth using
 CLB - Utility location and depth using
 CLA - Utility location and depth using

NOTES

1. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

2. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

3. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

4. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

5. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

6. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

7. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

8. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

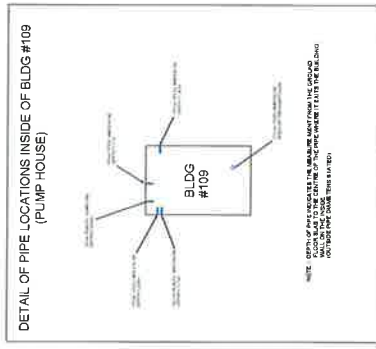
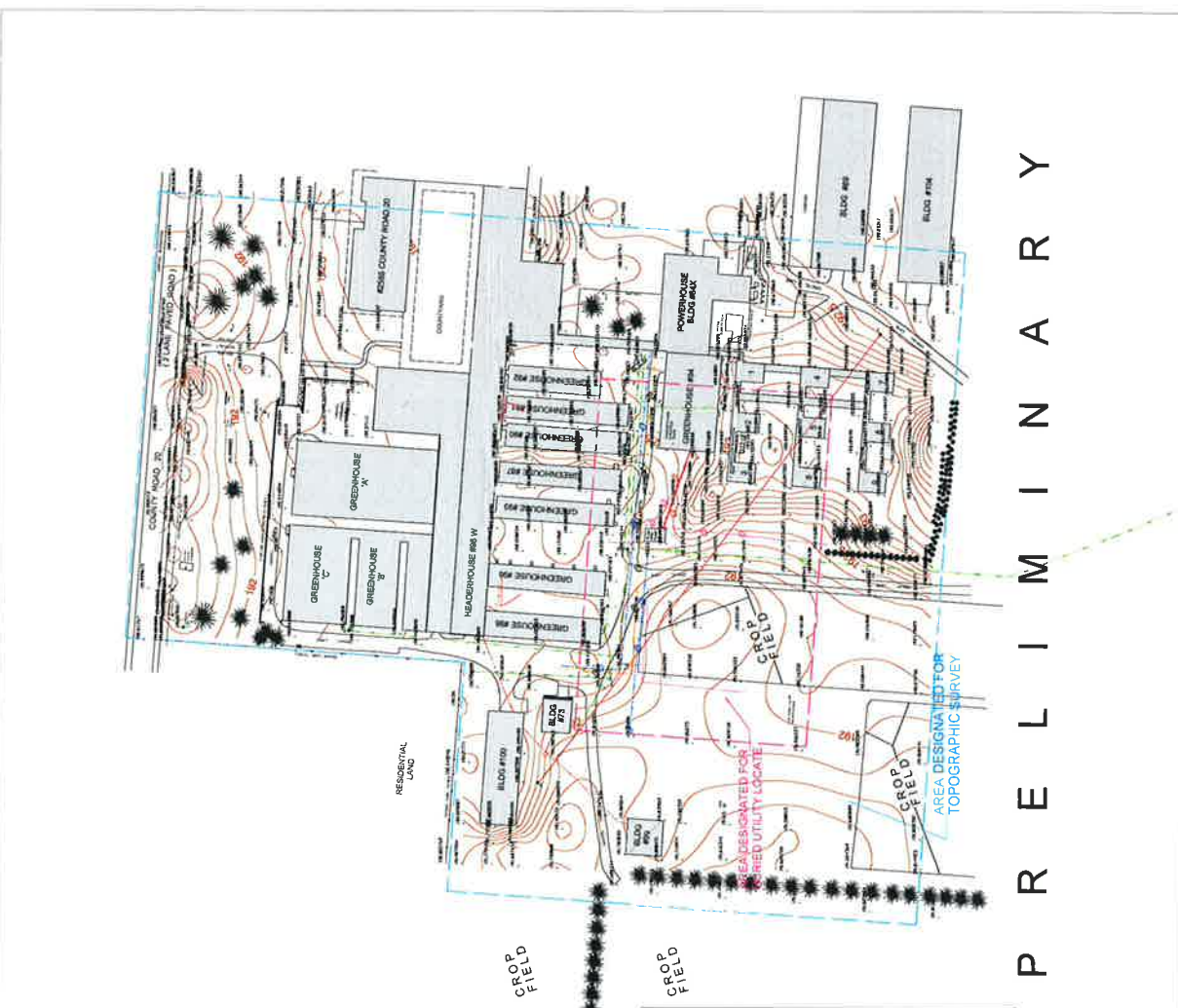
9. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

10. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose without the written consent of the engineer.

THE LOCATION OF APPROVED UTILITY SERVICES SHOULD BE MARKED AND IDENTIFIED BY THE CLIENT PRIOR TO THE START OF ANY CONSTRUCTION.



P R E L I M I N A R Y



MANHOLE & CATCH BASIN INVERT DATA

MH 1 (STORM)	MANHOLE	190.20m	100mm	CONC
MH 2 (STORM)	E INVERT	190.75m	100mm	CONC
	S INVERT	197.25m	100mm	CONC
	W INVERT	192.50m	100mm	PLASTIC
MH 3 (SANITARY)	E INVERT	190.48m	100mm	UNK
	S INVERT	196.60m	100mm	UNK
MH 4 (STORM)	MANHOLE	190.20m	100mm	CONC
	E INVERT	190.24m	100mm	CONC
	S INVERT	192.24m	100mm	CONC
MH 5 (SANITARY)	E INVERT	189.80m	100mm	PLASTIC
	S INVERT	192.27m	100mm	PLASTIC
MH 6 (SANITARY)	E INVERT	193.27m	100mm	PLASTIC
	S INVERT	190.00m	100mm	PLASTIC
CB 1	MANHOLE	191.51m	100mm	CONC
CB 2	MANHOLE	191.25m	100mm	CONC
CB 3	S INVERT	191.17m	200mm	PLASTIC
	E INVERT	191.30m	100mm	PLASTIC
CB 4	E INVERT	191.51m	200mm	PLASTIC
CB 5	MANHOLE	192.24m	100mm	PLASTIC

SCALE 1:750

0 15 30 METRES

SHEET 1 of 1

Rev No	1	Rev Date	08/28/2015	Rev Description	Final
2	08/28/2015	08/28/2015	08/28/2015	08/28/2015	08/28/2015
1	08/28/2015	08/28/2015	08/28/2015	08/28/2015	08/28/2015



Appendix "F"

INSURANCE TERMS

INSURANCE TERMS

- IN1 GENERAL
 - IN1.1 Worker's Compensation
 - IN1.2 Indemnification
 - IN1.3 Proof of Insurance
 - IN1.4 Insured
 - IN1.5 Payment of Deductible

- IN2 COMMERCIAL GENERAL LIABILITY
 - IN2.1 Scope of Policy
 - IN2.2 Period of Insurance

- IN3 AUTOMOBILE INSURANCE
 - IN3.1 Scope of Policy

- IN4 BUILDER'S RISK / INSTALLATION FLOATER
 - IN4.1 Scope of Policy
 - IN4.2 Amount of Insurance
 - IN4.3 Period of Insurance
 - IN4.4 Insurance Proceeds

IN1 GENERAL

IN1.1 Worker's Compensation

- 1) The Contractor shall provide and maintain Worker's Compensation Insurance in accordance with the legal requirements of the Province or Territory where the work is being carried out.

IN1.2 Indemnification

- 1) The insurance required by the provisions of these Insurance Terms shall in no way limit the Contractor's responsibility under the Indemnification clause of the General Conditions of the contract. Any additional coverage the Contractor may deem necessary to fulfill his obligations under the aforesaid clause shall be at his own discretion and expense.

IN1.3 Proof of Insurance

- 1) Before commencement of the Work, and within thirty (30) days after acceptance of its bid, the Contactor shall deposit with Canada a CERTIFICATE OF INSURANCE (form AAFC / AAC5314) available upon request.
- 2) Upon request by Canada, the Contractor shall provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the provisions contained herein.

IN1.4 Insured

- 1) Each policy shall insure the Contractor and shall include Her Majesty the Queen in right of Canada, represented by the Minister of Agriculture & Agri-Food Canada as an additional Insured, with respect to liability arising out of the operations of the contractor with regard to the work.

INSURANCE TERMS (Continued)

IN1.5 Payment of Deductible

- 1) The payment of monies up to the deductible amount made in satisfaction of a claim shall be borne by the Contractor.

IN2 COMMERCIAL GENERAL LIABILITY

IN2.1 Scope of Policy

- 1) The insurance coverage provided shall not be less than that provided by IBC Form 2100, as amended from time to time, and shall have:
 - (a) an Each Occurrence Limit of not less than \$5,000,000.00 ;
 - (b) a Products/Completed Operations Aggregate Limit of not less than \$5,000,000.00 ; and
 - (c) a General Aggregate Limit of not less than \$10,000,000.00 per policy year, if the policy is subject to such a limit.
- 2) The policy shall either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:
 - (a) Blasting.
 - (b) Pile driving and caisson work.
 - (c) Underpinning.
 - (d) Removal or weakening of support of any building or land whether such support be natural or otherwise if the work is performed by the insured contractor.
 - (e) Asbestos.
 - (f) Non-owed Automobile Policy.

IN2.2 Period of Insurance

- 1) Unless otherwise directed in writing by Canada, or, otherwise stipulated elsewhere herein, the policy required herein shall be in force and be maintained from the date of contract award until the day of issue of the Certificate of Completion except that the coverage for Completed Operations Liability shall, in any event, be maintained for a period of at least six (6) years beyond the date of the CERTIFICATE OF SUBSTANTIAL PERFORMANCE.

IN3 AUTOMOBILE INSURANCE

IN3.1 Scope of Policy

- 1) Automobile Liability Insurance in respect of licensed vehicles shall have limits of not less than one million dollars inclusive per occurrence for bodily injury, death, and damage to property.

INSURANCE TERMS (Continued)

IN4 BUILDER'S RISK / INSTALLATION FLOATER

IN4.1 Scope of Policy

- 1) The insurance coverage provided by a Builder's Risk policy or an Installation Floater policy shall not be less than that provided by IBC Forms 4042 and 4047, as amended from time to time.
- 2) The policy shall permit use and occupancy of the project, or any part thereof, where such use and occupancy is for the purposes for which the project is intended upon completion.
- 3) The policy may exclude or be endorsed to exclude coverage for loss or damage caused by any of the following:
 - (a) Asbestos.
 - (b) Fungi or spores.
 - (c) Cyber.
 - (d) Terrorism.

IN4.2 Amount of Insurance

- 1) The amount of insurance shall not be less than the sum of the contract value plus the declared value (if any) set forth in the contract documents of all material and equipment supplied by Canada at the site of the project to be incorporated into and form part of the finished Work. If the value of the Work is changed, the policy shall be changed to reflect the revised contract value.

IN4.3 Period of Insurance

- 1) Unless otherwise directed in writing by Canada, or, stipulated elsewhere herein, the policy required herein shall be in force and be maintained from prior to the commencement of work until the day of issue of the CERTIFICATE OF SUBSTANTIAL PERFORMANCE.

IN4.4 Insurance Proceeds

- 1) The policy shall provide that the proceeds thereof are payable to Her Majesty or as Canada may direct in accordance with GC 10.2 Insurance Proceeds.
- 2) The Contractor shall, without delay, do such things and execute such documents as are necessary to effect payment of the proceeds.



Appendix "G"

CONTRACT DOCUMENTS

MAJOR WORKS - CONTRACT DOCUMENTS

SC01 CONTRACT DOCUMENTS

- 1) The following are the contract documents:
 - (a) Contract page when signed by Canada;
 - (b) Duly completed Bid and Acceptance Form and any Appendices attached thereto;
 - (c) Drawings and Specifications;
 - (d) AAFC General Conditions form AAFC / AAC5321-E:
 - (i) GC1 General Provisions
 - (ii) GC2 Administration of the Contract
 - (iii) GC3 Execution and Control of the Work
 - (iv) GC4 Protective Measures
 - (v) GC5 Terms of Payment
 - (vi) GC6 Delays and Changes in the Work
 - (vii) GC7 Default, Suspension or Termination of Contract
 - (viii) GC8 Dispute Resolution
 - (ix) GC9 Contract Security
 - (x) GC10 Insurance
 - (e) Supplementary Conditions, if any;
 - (f) Insurance Terms form AAFC / AAC5315-E;
 - (g) Any amendment issued or any allowable bid revision received before the date and time set for solicitation closing;
 - (h) Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
 - (i) Any amendment or variation of the contract documents that is made in accordance with the General Conditions.
- 2) The language of the contract documents shall be the language of the Bid and Acceptance Form submitted.

SC02 ACCEPTANCE AND CONTRACT

- 1) Upon acceptance of the Contractor's offer by Canada, a binding Contract shall be formed between Canada and the Contractor. The documents forming the Contract shall be the contract documents referred to in SC01 CONTRACT DOCUMENTS.



Appendix "H"

CONTRACT

CONTRACT

PURCHASING OFFICE

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

Your tender is accepted to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the construction listed herein and on any attached sheets at the price or prices set out therefor.

Comments

Vendor / Firm Name and Address

Title		
Solicitation / Contract No.	Date	
Client Reference No.		
File No.		
Financial Code(s) <div style="text-align: right; margin-top: 10px;"> <input type="radio"/> GST <input type="radio"/> HST <input type="radio"/> QST </div>		
F.O.B		
Destination		
Applicable Taxes		
Included		
Destination		
Invoices - Original and two copies to be sent to :		
Address Enquiries to:		
Telephone No.	Ext.	Fax No.
Total Estimated Cost	Currency Type	
CAD		
For the Minister		
_____ Signature		_____ Date



FORMS

- Bid Bond
- Certificate of Insurance
- Labour and Material Payment Bond
- Performance Bond
- T4-A Certification

BID BOND

BOND NUMBER: _____

AMOUNT: _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,
hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Oblige, hereinafter called the Crown, in the amount of

_____ dollars (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__.

WHEREAS, the Principal has submitted a written tender to the Crown, dated the _____ day of _____, 20__,

for _____

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that if:

- (a) the Principal, should his tender be accepted within the period specified by the Crown, or, if no period be specified, within sixty (60) days after closing date of the tender, does execute within a period specified by the Crown, or, if no period be specified therein, within fourteen (14) days after the prescribed forms are presented to him for signature, execute such further contractual documents, if any, as may be required by the terms of the tender as accepted, and does furnish a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Contract price and satisfactory to the Crown, or other security acceptable to the Crown, or
- (b) the Principal does pay to the Crown the difference between the amount of the Principal's tender and the amount of the Contract entered into by the Crown for the work, supplies and services which were specified in the said tender, if the latter amount be in excess of the former,

then this obligation shall be void; otherwise it shall remain in full force and effect.

PROVIDED, HOWEVER, that the Surety and the Principal shall not be liable to the Crown for an amount greater than the amount specified in this bond.

PROVIDED FURTHER that the Surety shall not be subject to any suit or action unless such suit or action is instituted and process therefore served upon the Surety at its Head Office in Canada, within twelve (12) months from the date of this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal

Witness

Surety

Note: Affix Corporate seal if applicable.

CERTIFICATE OF INSURANCE

To be completed by the Insurer

CONTRACT					
Description and location of work					Contract No.
					Project No.
INSURER			BROKER		
Company name			Company name		
Unit/Suite/Apt.	Street number	Number suffix	Unit/Suite/Apt.	Street number	Number suffix
Street name			Street name		
Street type	Street direction	PO Box or Route Number	Street type	Street direction	PO Box or Route Number
Municipality (City, Town, etc.)			Municipality (City, Town, etc.)		
Province/State	Postal/ZIP code		Province/State	Postal/ZIP code	
INSURED			ADDITIONAL INSURED		
Contractor name			Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food Canada.		
Unit/Suite/Apt.	Street number	Number suffix			
Street name					
Street type	Street direction	PO Box or Route Number			
Municipality (City, Town, etc.)					
Province/State	Postal/ZIP code				
This insurer certifies that the following policies of insurance are at present in force covering all operations of the Insured, in connection with the contract made between the named insured and Her Majesty the Queen in right of Canada, represented by the Minister of Agriculture and Agri-Food Canada.					
POLICY					
Type	Number	Inception date	Expiry date	Limit of liability (\$)	
Commercial General Liability					
Builder's Risk "All Risks"					
Installation Floater "All Risks"					
Other (list)					
Each of these policies includes the coverages and provisions as specified in Insurance Terms and each policy has been endorsed to cover Her Majesty as an Additional Insured. The Insurer agrees to notify Her Majesty and the Named insured in writing thirty (30) days prior to any material change in, or cancellation of any policy or coverage.					
Name of Insurer's Officer or Authorized Employee		Telephone number		Ext.	
Signature		Date			

LABOUR AND MATERIAL PAYMENT BOND

BOND NUMBER: _____

AMOUNT: _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,
hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Obligee, hereinafter called the Crown, in the amount of

_____ dollars (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__

WHEREAS, the Principal has entered into a Contract with the Crown dated the _____ day of _____, 20__,
for _____

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that, if payment is promptly made to all Claimants who have performed labour or services or supplied material in connection with the Contract and any and all duly authorized modifications and extensions of the Contract that may hereafter be made, notice of which modifications and extensions to the Surety being hereby waived, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. For the purpose of this bond, a Claimant is defined as one having a direct contract with the Principal or any Sub-Contractor of the Principal for labour, material or both, used or reasonably required for use in the performance of the Contract, labour and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone services or rental of equipment (but excluding rental of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract.
2. For the purpose of this Bond, no payment is required to be made in respect of a claim for payment for labour or services performed or material supplied in connection with the Contract that represents a capital expenditure, overhead or general administration costs incurred by the Principal during the currency or in respect of the Contract.
3. The Principal and the Surety hereby jointly and severally agree with the Crown that if any Claimant has not been paid as provided for under the terms of his contract with the Principal or a Sub-Contractor of the Principal before the expiration of a period of ninety (90) days after the date on which the last of such Claimant's labour or service was done or performed or materials were supplied by such Claimant, the Crown may sue on this bond, have the right to prosecute the suit to final judgment for such sum or sums as may be due and have execution thereon; and such right of the Crown is assigned by virtue of Part VIII of the *Financial Administration Act* to such Claimant.
4. For the purpose of this bond the liability of the Surety and the Principal to make payment to any claimant not having a contract directly with the Principal shall be limited to that amount which the Principal would have been obliged to pay to such claimant had the provisions of the applicable provincial or territorial legislation on lien or privileges been applicable to the work. A claimant need not comply with provisions of such legislation setting out steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which the claimant might have had. Any such claimant shall be entitled to pursue a claim and to recover judgment hereunder subject to the terms and notification provisions of the Bond.
5. Any material change in the Contract between the Principal and the Crown shall not prejudice the rights or interest of any Claimant under this Bond who is not instrumental in bringing about or has not caused such change.

6. No suit or action shall be commenced hereunder by any Claimant:

- (a) Unless such Claimant shall have given written notice within the time limits hereinafter set forth to the Principal and the Surety above named, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to the Principal and the Surety at any place where an office is regularly maintained for the transaction of business by such persons or served in any manner in which legal process may be served in the Province or other part of Canada in which the subject matter of the Contract is located. Such notice shall be given
 - (i) in respect of any claim for the amount or any portion thereof required to be held back from the Claimant by the Principal or by the Sub-Contractor of the Principal under either the terms of the Claimant's Contract with the Principal or the Claimant's Contract with the Sub-Contractor of the Principal within one hundred and twenty (120) days after such Claimant should have been paid in full under this Contract;
 - (ii) in respect of any claim other than for the holdback or portion thereof referred to above within one hundred and twenty (120) days after the date upon which such Claimant did or performed the last of the service, work or labour or furnished the last of the materials for which such claim is made under the Claimant's Contract with the Principal or a Sub-Contractor of the Principal;
- (b) After the expiration of one (1) year following the date on which the Principal ceased work on the said Contract, including work performed under the guarantees provided in the Contract;
- (c) Other than in a court of competent jurisdiction in the province or district of Canada in which the subject matter of the Contract or any part thereof is situated and not elsewhere, and the parties hereto hereby agree to submit to the jurisdiction of such court.

7. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

8. The Surety shall not be entitled to claim any moneys relating to the Contract and the liability of the Surety under this Bond shall remain unchanged and, without restricting the generality of the foregoing, the Surety shall pay all valid claims of Claimants under this Bond before any moneys relating to the Contract held by the Crown are paid to the Surety by the Crown.

9. The Surety shall not be liable for a greater sum than the amount specified in this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal

Witness

Surety

Note: Affix Corporate seal if applicable.

PERFORMANCE BOND

BOND NUMBER: _____

AMOUNT: _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,
hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Obligee, hereinafter called the Crown, in the amount of

_____ dollars (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__.

WHEREAS, the Principal entered into a Contract with the Crown dated the _____ day of _____, 20__,
for _____

which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that, if the Principal shall well and faithfully observe and perform all the obligations on the part of the Principal to be observed and performed in connection with the Contract, then this obligation shall be void, otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. Whenever the Principal shall be, and declared by the Crown to be, in default under the Contract, the Surety shall:
 - (a) if the work is not taken out of the Principal's hands, remedy the default of the Principal,
 - (b) if the work is taken out of the Principal's hands and the Crown directs the Surety to undertake the completion of the work, complete the work in accordance with the Contract provided that if a contract is entered into for the completion of the work,
 - (i) it shall be between the Surety and the completing contractor, and
 - (ii) the selection of such completing contractor shall be subject to the approval of the Crown,
 - (c) if the work is taken out of the Principal's hands and the Crown, after reasonable notice to the Surety, does not direct the Surety to undertake the completion of the work, assume the financial responsibility for the cost of completion in excess of the moneys available to the Crown under the Contract,
 - (d) be liable for and pay all the excess costs of completion of the Contract, and
 - (e) not be entitled to any Contract moneys earned by the Principal, up to the date of his default on the Contract and any holdbacks relating to such earned Contract moneys held by the Crown, and the liability of the Surety under this Bond shall remain unchanged provided, however, and without restricting the generality of the foregoing, upon the completion of the Contract to the satisfaction of the Crown, any Contract moneys earned by the Principal or holdbacks related thereto held by the Crown may be paid to the Surety by the Crown.
2. The Surety shall not be liable for a greater sum than the amount specified in this Bond.
3. No suit or action shall be instituted by the Crown herein against the Surety pursuant to these presents after the expiration of two (2) years from the date on which final payment under the Contract is payable.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal

Witness

Surety

Note: Affix Corporate seal if applicable.



T4-A CERTIFICATION

The Contractor shall complete and submit this T4-A Certification within fourteen (14) calendar days of Notification of Contract award and within fourteen (14) calendar days immediately following any change to the information already provided under the Contract. Failure to provide this information or failure to provide the correct information shall result in a fundamental breach of the Contract.

1. **The Contractor shall enter a [x] in one of the boxes below opposite the description that best describes its status.**

- A business incorporated either federally or provincially;
- An unincorporated business, either as a sole proprietor or a partnership; or
- An individual.

Note: The information provided in Section 2 must correspond with that provided in Section 1.

Corporate or unincorporated business or individual's name: _____

Street Name or Box #: _____

City, Town or Village: _____

Province: _____

Postal Code: _____

2. **Contractor shall complete Section 2(a) or 2(b) or 2(c), whichever is applicable to its situation.**

(a) If incorporated:

Business Number (BN): _____, or
GST / HST Number: _____, or
T2 Corporation Tax Number (T2N): _____, whichever is applicable

(b) If unincorporated:

Social Insurance Number (SIN): _____, and
Business Number (BN): _____, or
GST / HST Number: _____, whichever is applicable

Note: The Unincorporated Business Name must be the same as the name associated with the Revenue Canada Business Number or the GST Number.

(c) If individual:

Social Insurance Number (SIN): _____, and
Business Number (BN): _____, or
GST / HST Number: _____, whichever is applicable

Note: The Individual's Name must be the same as the name associated with the Social Insurance Number.

3. **WE HEREBY CERTIFY** that I/We have examined the information provided above, including the legal name, address and Revenue Canada identifier (SIN, BN, GST / HST No., T2N), as applicable, and that it is correct and complete, and fully discloses my/our identification.

Contractor's signature	Title of Signatory	Date
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