Lakehead
UNIVERSITY

SPECIFICATION

LU Chancellor Paterson Library
Teachers Common Renovation
Thunder Bay, Ontario

Project No: 2017024

Date: August 2017

Set No.

FORM ARCHITECTURE ENGINEERING

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END OF SECTION

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GENERAL

1.1 INVITATION

.1 Bid Call

.1 Bid Call Deadline: General Contractor bids for **CBRE - Lakehead University Teaching Commons Renovation** signed under seal, executed, and dated will be **received in duplicate** at the **Lakehead University Purchasing Department, Room BB-1002A, 955 Oliver Road, Thunder Bay, Ontario, P7B 5E1,** no later than **3:00:00pm local time, Tuesday, September 12, 2017**

.2 The designated clock in Lakehead University Purchasing Department office shall be used to establish the time of Bid receipt.

.3 The University can only accept one bid from any proponent. Should a proponent wish to offer options or alternate pricing, these should be contained within their bid envelope, or if this is not possible, then they must be clearly identified as options and delivered at the same time as the primary bid.

.4 Faxed, Telephone, Telegraph or Electronic Mail Bids or Amendments to submitted Bids will not be accepted under any circumstances.

.5 Bids will be opened in camera and results will be made available as soon as practicable.

.6 Amendments to a submitted Bid will be permitted if received in writing prior to the Bid Call Deadline stated above and if endorsed by the same party or parties who signed and sealed the originally submitted Bid. Amendments to the Bid price shall contain only the dollar value to add or subtract from the originally submitted Bid.

.7 The Owner is not responsible to reimburse Bidders for any expenses, no matter how incurred, in the preparation of their Bid submission as required pursuant to the tender process.

.8 The Owner will not consider and will return unopened any Bids received after the Bid Closing Deadline.

1.2 COMPLIANCE

.1 Failure to submit a Bid which complies with the requirements of these Instructions to Bidders may cause the Owner to declare a Bid non-compliant.

.2 This RFP/RFQ is not intended to create, and shall not create a formal legally binding process. For greater certainty and without limitation, the RFP/RFQ shall not give rise to any 'Contract A' based tendering law duties or any other legal obligations arising out of any process contract or collateral contract. Neither the proponent nor the University shall have any rights to claims of breech of contract, tort or other claims against the other with respect to the award of a contract, failure to award a contract, or failure to honour a response to the RFP.

.3 No legal relationship or obligation regarding the procurement of any good or service shall be created between any proponent and the University by the RFP/RFQ process until the successful negotiation and execution of a written agreement for the delivery of the services described herein is completed.

.4 While pricing information provided in responses is non-binding prior to the execution of a written agreement, this information will be utilized in assessing proponent submission and will affect the scoring of proposals. Any inaccurate, misleading or incomplete information, including withdrawn or altered pricing could adversely affect the ranked score and or the contract award.

.5 The University may disqualify a Proponent or rescind a contract award without penalty should a proponent's response contain misrepresentations or other inaccurate, misleading, or incomplete information. No opportunity will be provided to proponents to rectify this kind of situation.

The University may also rescind a contract award should repeat violations of any University policy be encountered."

1.3 INTENT

.1 Intent of this Bid call is to obtain an offer to perform the Work which consists of Interior Renovations to Lakehead University Chancellor Patterson Library in the City of Thunder Bay, Ontario for a Stipulated Price Contract, in accordance with Contract Documents. Refer to Section 01 11 00 - Summary of the Work for a more in depth description of the Work.

.2 Work is to commence on site within ten (10) Working Days after the award of contract or issuance of a Letter of Intent.

.3 The Owner makes no representation, warranty or guarantee as to the accuracy of the information contained in the Contract Documents or issued by way of addenda. Any quantities shown or data contained in the Contract Documents or provided by way of addenda are estimates only and are for the sole purpose of indicating to Bidders the general size of the work. It is the Bidder's responsibility to avail itself of all the necessary information to prepare a tender in response to this Bid Call.

.4 All of the provisions of this Bid Call are deemed to be accepted by each Bidder and incorporated into each Bidder's tender

1.4 PROJECT IDENTIFICATION

.1 The Project is identified as **Lakehead University Teaching Commons Renovation,** Architect's file number 2017024 as prepared by FORM Architecture Engineering and associated Consultants with Drawing List as indicated on Drawings and Specification Sections within the Table of Contents..

1.5 BID CALL SCHEDULE

.1 The following is the schedule for the Bid Call:
- .1 Drawings available: Friday, September 8, 2017. Electronic drawings available on MERX.
- .2 Mandatory Site Visit: Thursday, September 14, 2017, 1:30pm local time at Chancellor Patterson Library , 955 Oliver Road, Main Entrance doors.
- .3 Bidder's Deadline for Questions: Monday, September 25, 2017, 3:00pm local time, all questions directed to LU Purchasing, gmatte@lakeheadu.ca.
- .4 Deadline for Issuing Addenda: Thursday, September 28, 2017, 3:00pm local time,
- .5 Bid Call Deadline: Thursday, October 5, 2017, 3:00:00pm local time. Bids opened immediately after close in a PRIVATE BID OPENING.
- .6 Anticipated Bid Award Date: Monday, October 9, 2017
- .7 Substantial Performance: Wednesday, January 31, 2018.

1.6 CONTRACT/BID DOCUMENTS

.1 Bid Form.

.2 Definitions
- .1 Except as otherwise defined in these Instructions to Bidders, the defined terms in these Bid Documents are taken from the Contract. The term Contract is defined in the Agreement.
- .2 Bid Documents: Contract Documents supplemented with Instructions to Bidders, Bid Form, and Bid Supplementary Forms identified therein, Agreement, Definitions and General Conditions of the CCDC2 - 2008 document,

Supplementary Conditions, Specifications (per Table of Contents), Drawings (per Drawing List) and Addenda issued during Bidding period.

.3 Bid, Offer, or Bidding: Act of submitting an offer under seal.

.4 Bid Price: Monetary sum identified in Bid Form as an offer to perform required work.

.3 Availability

.1 Bidders to obtain Bid Documents only through MERX™, the electronic tendering system used by Lakehead University for this tender. For further information about MERX™, call 1-800-964-MERX™ or visit the MERX™ website at www.merx.com.

.2 A Bidder who has not obtained the Bid Documents through MERX™ may have its Bid disqualified by the Owner at it's Sole discretion.

.3 The Bid Documents are made available only for the purpose of submitting Bids for the Project. Availability and/or use of the Bid Documents do not confer a licence or grant for any other purpose.

.4 Immediately notify Bid Coordinator if Bid Documents are missing or incomplete or upon finding discrepancies or omissions.

.5 Printed Construction Documents:

.1 Sets of Contract Documents including drawings, specifications and addenda required by the successful Contractor and their sub-trades and suppliers for the purpose of construction are the responsibility of the Contractor. The Consultant will provide printable documents in a PDF format to the Contractor for this purpose.

.4 Examination

.1 Bid Documents are on display for examination by Sub-trades and suppliers at the offices of the:

.1 Construction Association of Thunder Bay, 857 May Street N., Thunder Bay, Ontario P7C 3S2, Telephone (807) 624-2999, Facsimile: (807) 623-2296. E-mail: information@catb.on.ca.

.5 Queries/Addenda

.1 Direct questions are to be provided in written form only to:
Bid Coordinator:
Geoff Matte, Manager of Procurement and Contract Services
University Centre Building
Room: BB 1002A
955 Oliver Road, Thunder Bay, Ontario P7B 5E1
Fax: (807) 346-7711, Email: gmatte@lakeheadu.ca
No telephone enquiries will be accepted.

.2 The Bid Coordinator is the sole contact for the Bidders in respect of Bidding on this Project. A Bid may be disqualified where contact is made with any person other than the Bid Coordinator.

.3 Neither the Owner nor the Consultant will be responsible for instructions, clarifications or amendments communicated orally.

.4 The Bid Documents may only be amended by an addendum in accordance with this section. If Lakehead University, for any reason, determines that it is necessary to provide additional information relating to this Bid, such information will be communicated to all Bidders by addenda by way of MERX™. Each addendum shall form an integral part of the Bid Documents.

.5 If Bidders find discrepancies, omissions, errors, departures from building by-laws, codes or good practice, and points considered to be ambiguous or conflicting, they shall bring them to the attention of the Bid Coordinator by e-mail only, and not less than nine (9) Calendar Days before the Bid Call Deadline, so that the Bid Coordinator, if deemed necessary, can issue instructions, clarifications or amendments by addendum to all Bidders prior to the Bid Call Deadline. The Bid Coordinator will endeavour to issue such addenda at least seven (7) Calendar Days prior to the Bid Call Deadline.

.6 Each addendum shall form an integral part of the Bid Documents and their receipt shall be acknowledged in the space provided on the Bid Form.

.7 Such addenda may contain important information including significant changes to the Bid Documents. Bidders are responsible for obtaining all addenda issued by the Bid calling authority.

.6 Approved Equals

.1 Where Bid Documents stipulate a particular product, substitutions will be considered by the Consultant up to ten (10) Working Days before the Bid Call Deadline.

.2 A request for substitution shall indicate the specification section of the specified product, the product name and number of the specified product, the product name and number of the substitution and other information that will allow the Consultant to make an informed decision including but not limited to the substitutions size and shape; available colour selection; any minor variance from the specified product; proprietary product specifications, drawings or brochures.

.3 When a request to substitute a product is made, the Consultant may approve the substitution and inform the Bid Coordinator to issue an addendum. Verbal approval is only binding when confirmed by written addenda.

.4 In submission of substitutions to products specified, Bidders shall include in their Bid, any changes required in work to accommodate such substitutions. A later claim by Bidder for an addition to contract price because of changes in work necessitated by use of substitutions shall not be considered.

.7 Alternates/Unit Prices

.1 General Contractors are invited to submit Unsolicited General Contractor Alternatives to the tendered price for alternative materials or methods not approved prior to the Bid Call Deadline.

.2 Unsolicited General Contractor Alternatives will not be used to determine the lowest Bid and will only be used when approved by the Owner and the Contract Price will be adjusted accordingly.

.3 Provide complete information on required revisions to other Work to accommodate each Unsolicited General Contractor Alternative, dollar amount of additions to or reductions from Bid Price, including revisions to other Work.

.4 Unless Unsolicited General Contractor Alternatives are submitted in this manner and subsequently accepted, provide products as specified.

.5 Invited Alternatives, Separate Prices and Unit Prices listed in Section 01 23 10 must be shown on the Bid Form. Tenders missing this information may be declared informal and are subject to rejection.

1.7 HST

.1 The Harmonized Sales Tax (HST) is considered an applicable value added tax for the purpose of this Bid, however the Bid price shall NOT include Value Added Taxes. All other eligible taxes shall be included in the Bid price. The successful contractor will indicate on each application for payment as a separate amount the appropriate HST the Owner is legally obliged to pay.

.2 Any taxes or increases to taxes announced prior to the date of the issuance of the Bid Documents and scheduled to come into effect subsequent to it shall be taken to be included in the Bid price.

1.8 PERMITS AND FEES

.1 The Contractor will obtain and pay for the Building Permit.

.2 Contractors are to obtain and pay for required permits for plumbing and electrical work and any associated costs.

.3 Contractors are to obtain and pay for any other required permits, fees and licences required to complete the project..

1.9 INSURANCE

.1 The Contractor will purchase the “Broad Form” property insurance as required as part of CCDC 41.

.2 The Contractor shall provide General Liability insurance and all other insurances as per Section 00 80 00 - Supplementary Conditions and the CCDC2 2008 Stipulated Price Contract document and the CCDC41 Insurance Requirements document.

.3 The Contractor will be responsible for the payment of the deductable on all claims. The deductable will be in the amount of $5,000.00.

1.10 SITE ASSESSMENT

.1 Site Examination

- .1 All General Contractors must visit project site and surrounding area before submitting a Bid. A **Mandatory Site Visit will be arranged at 1:30pm, Thursday, September 14, 2017** for all bidders to review the site with the consultant and the owner. Bidder must ensure they register his/her name, title and company name with the Consultant conducting Site Visit.
- .2 Arrangements must be made with the Consultant and Bidder must ensure they register his/her name, title and company name with the Consultant conducting Site Visit if bidders wish to visit the site at some other time.
- .3 Failure to attend the site and to register will result in your Bid being disqualified.
- .4 Bidders shall ensure they attend the site meeting punctually. Failure to do so may result in the Consultants refusal of the Proponent(s) registration on attendance at Consultants sole and absolute discretion.
- .5 Bidders to meet at the **Chancellor Paterson Library Building Main Entrance Vestibule.**
- .6 Bidders are required to take note of all existing site features visible at time of tendering which may affect the work. No allowance will be made for additional costs and no claims will be entertained in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence prior to submitting a bid.
- .7 Contractors shall provide all work required to accommodate the existing site and to achieve the final design intent as shown regardless of whether such work is specifically indicated in the contract documents.

1.11 BID SUBMISSION

.1 Bid Price

- .1 The Bid Form provides that the Bid price shall be provided in numbers only.
- .2 Where the Bid Forms require the Bidder to provide a breakdown of the Bid price, the Bid price shall govern in the case of conflict or ambiguity between the Bid price and the sum of the breakdown of the Bid price.

.2 Bid Ineligibility

- .1 Bids that are not originals, unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the Owner’s sole discretion, be declared non-compliant.
- .2 Bids with Bid Forms and enclosures which are improperly prepared may, at the Owner’s sole discretion, be declared non-compliant.
- .3 Bids that fail to include Bid security, bonding or insurance requirements when requested at Bidding stage, may at the Owner’s sole discretion, be declared non-compliant.

.3 Submissions
- .1 Bidders shall be solely responsible for delivery of their Bids in the manner and time prescribed.
- .2 Submit two (2) copies of executed offer on Bid Forms provided, signed and with corporate seal together with required Bid Bond in a sealed, opaque envelope, clearly identified by the Tender Return Label in accordance with Appendix H in Section 00 41 10 - Stipulated Price Bid Form.
- .3 Fill in all blank spaces on the Bid Forms in ink or typewritten, providing all information requested. Spaces not used or not required to be filled in to be marked N/A. Failure to provide all requested information on the Bid Forms and failure to fill in all blank spaces may result in a Bid being declared non-compliant.
- .4 Use only the Bid Forms issued as part of the Bid Documents for the Project.
- .5 Except where expressly set out to the contrary in this RFT or in the Bidder's tender, the tender and any accompanying documentation submitted by a Bidder shall become the property of the Owner and shall not be returned.

1.12 BID ENCLOSURES/REQUIREMENTS

.1 Bid Security
- .1 Bids shall be accompanied by Bid security in the form of a Bid Bond in the amount of not less than 10% of the Bid price naming the Owner as obligee and issued by a surety licensed to conduct surety and insurance business in Ontario.
- .2 Use latest edition CCDC approved bond form.
- .3 The Bid security shall remain valid for a period of sixty (60) days from the date of Bid submission.
- .4 Include costs of Bid security in Bid price.
- .5 The Bid security of the Bidder whose Bid is accepted will be retained by the Owner to compensate the Owner for the damages it will suffer should the successful Bidder fail to execute the Contract and/or fail to provide the specified performance security and/or evidence of insurance and other documents required by these Instructions to Bidders or by the Contract.
- .6 The Bid security of the Bidder whose Bid is accepted will be returned after the delivery of the specified performance security and evidence of insurance and other documents required by these Instructions to Bidders or by the Contract, and after the execution of the Contract.
- .7 The Bid security of all other Bidders will be returned after the execution of the Contract or after the expiry of this Bid process without an award of Contract or after the rejection of all Bids.
- .8 Bids not accompanied by the required Bid security and the required agreement to bond will be declared non-compliant by the Owner and rejected.

.2 Agreement to Bond.
- .1 Submit with Bid Form and Bid Bond, an Agreement to Bond, stating that Surety providing Bid Bond is willing to supply 50% Performance Bond and 50% Labour and Materials Payment Bond.
- .2 Include cost of bonds in Bid Price.

.3 Performance Assurance
- .1 Accepted Bidder must provide executed 50% Performance Bond and 50% Labour and Materials Payment Bond.
- .2 Include cost of bonds in Bid Price.

.4 Bid Form Requirements.
- .1 State in the Bid Form the time required to complete the Work. Completion date in Agreement must be completion time added to commencement date of the Work.
- .2 Within two hours after the Bid Call Deadline, a Bidder shall submit a List of Subcontractors the Bidder proposes to perform an item of the Work called for by the Contract. Failure of the Bidder to list Subcontractors and Suppliers, where

required, or the listing by a Bidder of more than one Subcontractor or Supplier to perform or supply an item of work listed, may result in the Bid being declared non-compliant. Bidders to list as a minimum the following Sub-trades:

.1 Hazardous Materials Abatement
.2 Rough Carpentry
.3 Architectural Woodworking
.4 Hollow Metal Doors and Frames
.5 Wood Doors
.6 Glazing
.7 Studs and Gypsum Board
.8 Acoustic Ceilings
.9 Flooring
.10 Painting
.11 HVAC
.12 Plumbing
.13 Controls/TAB
.14 Fire Alarm
.15 Electrical

.3 Where the Bidder lists “Own Forces” in lieu of a Subcontractor, the Bidder shall carry out such items of the Work with it’s “Own Forces”. Where “Own Forces” have been listed by the Bidder, the Owner reserves the right to obtain information from the Bidder and from third parties respecting the qualifications and experience of the Bidder’s “Own Forces” for such items of the Work. If the Owner determines that the Bidders “Own Forces” are not sufficiently qualified or sufficiently experienced to undertake such item of the Work, the Owner in it’s sole and absolute discretion, may reject the Bid.

.5 Bid Signing

.1 Bid Form shall be signed under seal by the Bidder and the person(s) signing such Bid Form must be authorized to bind the Bidder.
.2 Sole Proprietorship : Signature of sole proprietor in presence of witness who will also sign. Insert words "Sole Proprietor" under signature. Affix seal.
.3 Partnership : Signature of all partners in presence of witness who will also sign. Insert word ‘Partner’ under each signature. Affix seal to each signature.
.4 Limited Company : Signature of duly authorized signing officer(s) in normal signatures. Insert officer's capacity in which signing officer acts, under each signature. Affix corporate seal. If Bid is signed by officials other than President and Secretary of company, or President-Secretary-Treasurer of company, copy of by-law resolution of Board of Directors authorizing them to do so must also be submitted with Bid in Bid envelope.
.5 Joint Venture : Each party of joint venture must execute Bid under respective seals in manner appropriate to such party as described above, similar to requirements of Partnership.

.6 Appendices to Bid Form

.1 Appendix A - Contract Documents : Include a complete listing of all documents and information issued by which Bid price was derived.
.2 Appendix B - Subcontractors : Include names of all Subcontractors and portion of work Bidder will perform.
.3 Appendix C - Alternatives : Include cost variation to Bid price applicable to work described in Section 01 23 10 - Alternatives.
.4 Appendix D - Itemized Prices : Include a listing of Itemized prices specifically requested in Bid Documents
.5 Appendix E - Cash Allowances : Include a listing of Cash Allowances specifically requested in Bid Documents. (including Contingency Allowance)
.6 Appendix F - Unit Prices : Include a listing of unit prices specifically requested in Bid Documents.
.7 Appendix G - Separate Prices : Include a listing of separate prices as specifically requested in Bid Documents.

.8 Appendix H -Tender Return Label: Complete and affix Tender Return Label to front of Bid submission envelope.

.7 Supplementary Bid Information
.1 Prior to commencing Work, the Contractor shall deliver to the Owner:
.1 A Workplace Safety Insurance Board Certificate in good standing with the Workplace Safety Insurance Board,
.2 Valid Performance and Labour and Materials bonds, each bond to comply with the requirements of the Bid Documents,
.3 Stand alone certified true copies of insurance policies required by the Bid Documents naming the Owner and the Consultant as “additional insureds”.

1.13 OFFER ACCEPTANCE/ REJECTION

.1 Duration of Offer
.1 Bids shall remain open to acceptance for a period of sixty (60) days after the Bid Call Deadline. Bidders will be formally notified of tender award and status of Bid as soon as practical.

.2 Bid Clarifications
.1 The Owner reserves the right to seek clarification and/or supplementary information from Bidders after the Bid Call Deadline. The response received by the Owner from a Bidder shall, if accepted by the Owner, form an integral part of that Bidder's tender. The Owner reserves the right to interview or request presentations from any or all Bidders to obtain information or clarification regarding their Bid submissions. In the event that the Owner receives information at any stage of the evaluation process which results in earlier information provided by the Bidder being deemed by the Owner to be inaccurate, incomplete or misleading, the Owner reserves the right to reconsider the Bidders compliance with the requirements and adjust the Bidders ranking accordingly. A bid may be declared non-compliant as a result of information proven to be incomplete, inaccurate or misleading at the discretion of the owner.

.3 Reserved Rights of the Owner, the Owner may:
.1 make public the names of any or all Bidders;
.2 request written clarification or the submission of supplementary written information in relation to the clarification request from any Bidder and incorporate a Bidder’s response to that request for clarification into the Bidder’s tender;
.3 reject a Bidder’s tender on the basis of:
.1 the Bid being limited by way of addition or omission of information,
.2 the requirements for Bid security not being satisfied,
.3 it not being signed by an authorized person or it was not properly witnessed or sealed,
.4 it not being submitted on the prescribed Bid Form,
.5 changes being made to the Bid Form,
.6 a financial analysis determining the actual cost of the tender when considering factors including quality, service, price and transition costs arising from the replacement of existing goods, services, practices, methodologies and infrastructure (howsoever originally established);
.7 information provided by references,
.8 the bidder’s past performance on previous contracts awarded by the Owner,
.9 the information provided by a Bidder pursuant to the Owner exercising its clarification rights under this Bid Call process, or
.10 other relevant information that arises during this Bid Call process;
.4 waive formalities and accept tenders which substantially comply with the requirements of this Bid Call;
.5 verify with any Bidder or with a third party any information set out in a tender;

.6 check references other than those provided by any Bidder;
.7 disqualify any Bidder whose tender contains misrepresentations or any other inaccurate or misleading information;
.8 disqualify any Bidder or the tender of any Bidder who has engaged in conduct prohibited by this Bid Call;
.9 make changes, including substantial changes, to this Bid Call provided that those changes are issued by way of addenda in the manner set out in this Bid Call;
.10 select any Bidder other than the Bidder whose tender reflects the lowest cost to the Owner;
.11 cancel this Bid Call process at any stage;
.12 cancel this Bid Call process at any stage and issue a new Bid Call for the same or similar deliverables;
.13 accept any tender in whole or in part;
.14 discuss with any Bidder different or additional terms to those contemplated in this Bid Call or in any Bidder's tender;
.15 if a single tender is received, reject the tender of the sole Bidder and cancel this Bid Call process or enter into direct negotiations with the sole Bidder; or,
.16 reject any or all tenders in its sole and absolute discretion;

.4 These reserved rights are in addition to any other express rights or any other rights which may be implied in the circumstances and the Owner shall not be liable for any expenses, costs, losses or any direct or indirect damages incurred or suffered by any Bidder or any third party resulting from the Owner exercising any of its express or implied rights under this Bid Call.

.5 By submitting its tender, the Bidder authorizes the collection by the Owner of the information set out under 1.13.3.5 and 1.13.3.6 in the manner contemplated in those subparagraphs.

.6 The low Bid shall be determined on the basis of lowest Bid in accordance with Contract Documents on which Project is to be actually constructed, including those Alternatives and Separate Prices for which prices have been invited and which are to be incorporated in the Work. Unsolicited General Contractor Alternatives, not approved prior to the close of tender, will not be used to determine the Low Bid.

.7 In the event that the lowest Bid is over budget but within 15%, the Owner may choose to negotiate reductions in the Contract Price with the lowest Bidder only. Should the Owner be seeking reductions in excess of this amount the Owner may choose to re-tender the Project.

.8 After acceptance by Owner, the Owner’s Project Manager will issue to the successful Bidder, a written Bid acceptance.

1.14 LIMIT OF LIABILITY

.1 The liability of the Bidder to the Owner for loss and damage arising out of the Bidder's breach of the "Bid contract" shall be limited to the lesser of the actual loss suffered by the Owner and the amount of Bid security described in paragraph 1.12.1 Bid Security.

.2 The liability of the Owner to any Bidder for loss and damage arising in tort or for the breach by the Owner of the "Bid contract" shall be limited to the lesser of the amount of Bid security described in paragraph 1.12.1 Bid Security and the reasonable cost to the Bidder of preparing its Bid.

1.15 GOVERNING LAW OF THE BID CALL PROCESS

.1 This Bid Call process shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein.

1.16 COMMUNICATION

.1 The Bidder shall not engage in any Conflict of Interest communications and should take note of the Conflict of Interest declaration requirements in the Bid Call.

.2 Bidders shall not issue or make any statements or news release concerning their Bid, the Bid process, the Owner's evaluation of the Bids, or the Owner's award or cancellation of the Bid process without the express written consent of the Owner.

1.17 INFORMATION OBTAINED FROM THE OWNER

.1 All information provided by or obtained from the Owner in any form in connection with this Bid Call either before or after the issuance of this Bid Call: (a) is the sole property of the Owner and must be treated as confidential; (b) is not to be used for any purpose other than replying to this Bid Call and the performance of any subsequent Contract; (c) must not be disclosed without prior written authorization from the Owner; and d) shall be returned by the Bidders to the Owner immediately upon the request of the Owner.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

1.1 Hazardous Substance Report

.1 A copy of the detailed Hazardous Substance Report is bound into this specification following this section
- .1 Titled:
  - .1 Asbestos Audit, Lakehead University Thunder Bay, Ontario Chancellor Paterson Library, Fifth Floor
- .2 Date: 09/26/08
- .3 File Number: 47457
- .4 Prepared by:
  - .1 Pinchin Environmental.

.2 The report records the location and type of Asbestos Containing Material (ACM) and Lead within the structure, as well as identify other designated/hazardous substances that could require special handling or disposal prior to or during the proposed demolition.

.3 Refer to other Sections for the required remediation of ACM's and other designated or hazardous substances.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

HMIS Hazardous Materials Inventory System

Client: Lakehead University
Site: Lakehead University
Building Name: Chancellor Paterson Library
Building #: 13
Date: 10/07/17 08:31:03 EDT
User: Shannon

Lakehead UNIVERSITY

Observation Report for Location #11:

[Print] [Close]

Building #: 13 Building Name: Chancellor Paterson Library Surveyor: B Antoniuk Survey Date: 2006-09-08
Location #: 11 Location Name: Bibliographic Processing Floor: 5 Square Feet: 3000 Room #: 5003

System	Component	Material	Item	Covering	Access	Visible	Condition Qty & Action			Units	Sample	Hazard	Friability
							Good	Fair	Poor				
Floor	NI	Carpet	(No Information)	(No Information)	NI	NI				NI	NI **NI**	None	
Ceiling	NI	Lay-in ceiling tiles	Surface	N/A	C	Y	770			SF	V **0000**	None	
Wall	NI	Drywall and MJC	Surface	N/A	A	Y	99 (7)		1 (3)	%	S **0023**	Confirmed Asbestos	Non-Friable
Wall	NI	Masonry	Surface	N/A	A	Y	100			%		[None]	
Structure	Column	Plaster	Surface	N/A	A	Y	100			%	S **0017**	None	
Structure	Column	Plaster	Surface	N/A	A	Y	100			%	S **0016**	None	
Structure	Column	Steel	Surface	Plaster	A	N				NI	NI **NI**	None	
Structure	Deck	Steel	Surface	Fibrous Fireproofing	C	N				NI	NI **NI**	None	
Structure	Deck	Fibrous Fireproofing	Surface	N/A	C	N	3000			SF	V **0004**	None	
Piping	All	Fibreglass	Straight	Canvas	C	N				NI	NI **NI**	None	
Duct	All	Fibreglass	Surface	Foil Face	C	N				NI	NI **NI**	None	
Mechanical Equipment	Not Found	(No Information)	(No Information)	(No Information)	NI	NI				NI	NI **NI**	None	

Note:

No changes (PSC) 2017 /// Revised (CJL) 2016// Revised (MB) 2015 /// LEAD - Painted building materials were examined using a Niton X-Ray Fluorescence (XRF) analyzer. This method reports lead content in units of milligrams per square centimetre (mg/cm2) of the examined surface area and there is no direct correlation between these XRF measurement units and other measurement units such as mass percent. This method has been shown to detect lead concentrations at or above the CHPA definition of 0.009% lead. XRF results are reported as either positive or negative for lead content. The following lead containing materials were identified in the subject area: Light Blue Paint on Concrete Block Walls; Teal Paint on Metal Door Frames; Purple Paint on Metal Doors; Light Blue Paint on Gypsum Board Walls; Light Blue Paint on Metal Radiators. /// MERCURY - A visual examination of the subject area was conducted for potential mercury containing equipment such as thermostats, switches, and fluorescent light tubes. The following mercury containing equipment was observed in the subject area: Fluorescent Light Tubes. ///

Legend:

Action				Access		Condition		Sample Number	
(1)	Clean Up of ACM Debris	(2)	Precautions for Access Which may Disturb ACM Debris	A	Accessible to all building occupants	Good	No visible damage or deterioration.	S####	Sample collected
(3)	ACM removal	(4)	Precautions for Work Which may Disturb ACM in Poor Condition	B	Accessible to maintenance and operations staff without a ladder	Fair	Minor, repairable damage, cracking or deterioration.	V####	Material is visually identified to be identical to S####
(5)	Proactive ACM removal (Minimum repair required for fair condition)	(6)	ACM repair	C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas	Poor	Irreparable damage or deterioration with exposed and missing material	V0000	Known non-asbestos material
(7)	Management program and surveillance			D	Not normally accessible or without demolition	NOTE: See report for full definitions of action, access and condition		V9000	Material is known to contain asbestos
								V9500	Material is presumed to contain asbestos
NOTE: Actions in round brackets ( ) are auto-calculated. Actions in square brackets [ ] are manual								Note: Presumed various materials identified in the report are ACM if not sampled.	

Units SF - Square Feet LF - Linear Feet EA - EACH % - Percentage

HMIS Hazardous Materials Inventory System

Client: Lakehead University
Site: Lakehead University
Building Name: Chancellor Paterson Library
Building #: 13
Date: 10/07/17 08:31:25 EDT
User: Shannon

Lakehead UNIVERSITY

Observation Report for Location #15:

[Print] [Close]

Building #: 13 Building Name: Chancellor Paterson Library Surveyor: B Antoniuk Survey Date: 2006-09-08

Location #: 15 Location Name: Staff Room Floor: 5 Square Feet: 410 Room #: 5005

System	Component	Material	Item	Covering	Access	Visible	Condition Qty & Action			Units	Sample	Hazard	Friability
							Good	Fair	Poor				
Floor	NI	Carpet	(No Information)	(No Information)	NI	NI				NI	NI **NI**	None	
Floor	NI	VAT and Mastic Adhesive	Surface	N/A	A	Y	72			SF	V **0000**	None	
Ceiling	NI	Lay-in ceiling tiles	Surface	N/A	C	Y	410			SF	V **0000**	None	
Wall	NI	Drywall and MJC	Surface	N/A	A	Y	100 (7)			%	V **0023**	Confirmed Asbestos	Non-Friable
Structure	Beam Deck Joist	Fibrous Fireproofing	Surface	N/A	C	Y	410			SF	V **0003**	None	
Structure	Beam Deck Joist	Steel	Surface	Fibrous Fireproofing	C	Y				NI	NI **ni**	None	
Piping	All	Fibreglass	Straight	Canvas	C	N				NI	NI **NI**	None	
Duct	All	Fibreglass	Surface	Foil Face	C	N				NI	NI **NI**	None	
Mechanical Equipment	Not Found	(No Information)	(No Information)	(No Information)	NI	NI				NI	NI **NI**	None	

Note:

No changes (PSC) 2017 /// No changes. (cjl) 2016// No Changes (MB) 2015 /// LEAD - Painted building materials were examined using a Niton X-Ray Fluorescence (XRF) analyzer. This method reports lead content in units of milligrams per square centimetre (mg/cm2) of the examined surface area and there is no direct correlation between these XRF measurement units and other measurement units such as mass percent. This method has been shown to detect lead concentrations at or above the CHPA definition of 0.009% lead. XRF results are reported as either positive or negative for lead content. The following lead containing materials were identified in the subject area: Teal Paint on Metal Door Frames; Purple Paint on Metal Doors; Light Blue Paint on Gypsum Board Walls. /// MERCURY - A visual examination of the subject area was conducted for potential mercury containing equipment such as thermostats, switches, and fluorescent light tubes. The following mercury containing equipment was observed in the subject area: Fluorescent Light Tubes. ///

Legend:

Action				Access		Condition		Sample Number	
(1)	Clean Up of ACM Debris	(2)	Precautions for Access Which may Disturb ACM Debris	A	Accessible to all building occupants	Good	No visible damage or deterioration.	S####	Sample collected
(3)	ACM removal	(4)	Precautions for Work Which may Disturb ACM in Poor Condition	B	Accessible to maintenance and operations staff without a ladder	Fair	Minor, repairable damage, cracking or deterioration.	V####	Material is visually identified to be identical to S####
(5)	Proactive ACM removal (Minimum repair required for fair condition)	(6)	ACM repair	C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas	Poor	Irreparable damage or deterioration with exposed and missing material	V0000	Known non-asbestos material
(7)	Management program and surveillance			D	Not normally accessible or without demolition	NOTE: See report for full definitions of action, access and condition		V9000	Material is known to contain asbestos
								V9500	Material is presumed to contain asbestos
NOTE: Actions in round brackets ( ) are auto-calculated. Actions in square brackets [ ] are manual								Note: Presumed various materials identified in the report are ACM if not sampled.	

Units SF - Square Feet LF - Linear Feet EA - EACH % - Percentage

SECTION 004110 STIPULATED PRICE BID FORM

Project /Contract: _____

Project/Contract No: _____

From (Bidder): _____
company name

_____
street address or postal box number

_____
city/town, province and postal code

To (Owner): _____

_____

We, the undersigned, having examined the Bid Documents for the above-named project/contract, including Addendum Number(s) _____ , and having visited the Place of Work, hereby offer to perform the Work in accordance with the Bid Documents, for the stipulated [base bid] price of:

$ _____

_____ in Canadian dollars, excluding value added taxes.
amount in writing

$ _____ in Canadian dollars, excluding value added taxes.
amount in figures

We, the undersigned, declare that:

(a) we agree to attain Substantial Performance of the Work within _____ weeks after receiving notice of contract award,

(b) we have arrived at this bid without collusion with any competitor,

(c) this bid is open to acceptance by the Owner for a period of sixty (60) days from the date of bid closing, and

(d) all bid form supplements called for by the Bid Documents form an integral part of this bid.

Signatures:

Signed and Submitted by:

_____
company name

_____
name and title of authorized signing officer

_____
signature of authorized signing officer

_____
name of witness

_____
signature of witness

_____
name and title of authorized signing officer

_____
signature of authorized signing officer

_____
name of witness

_____
signature of witness

Dated this _____ day of _____, 20 _____

Note: Affix corporate seal as required by Bid Documents.

Appendix A - LIST OF BID DOCUMENTS

Project /Contract:

Project/Contract No:

From (Bidder): _____

company name

We, the above-named bidder, have based our bid on the following Bid Documents:

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

[ ]

Appendix B - LIST OF SUBCONTRACTORS

Project /Contract:

Project/Contract No:

From (Bidder): _____

company name

We, the above-named bidder, propose to use for the above-named project/contract, the Subcontractors named below:

Item of Work	**Name of Subcontractor**
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____
[ ]	_____

Appendix C - ALTERNATIVE PRICES

Project /Contract:

Project/Contract No:

From (Bidder): _____

company name

We, the above-named bidder, offer below the requested alternative prices. The amount to be added to, or deducted from, our base bid (as entered in the Bid Form) is entered for each requested alternative. All alternative prices exclude Value Added Taxes. If there is no change to the base bid price for an alternative, we have so indicated. It is understood that:

(a) the Owner may accept any of the alternatives and corresponding alternative prices in any order or combination, including all or none,

(b) In accordance with the CCDC Document No. 23 - A Guide to Calling Bids and Awarding Contracts, the low bid shall be determined on the basis of the lowest tender in accordance with the Contract Documents on which the Project is to be actually constructed, including those alternatives for which prices have been invited and which are to be incorporated into the Work.

(c) alternatives and alternative prices are open for acceptance by the Owner for the same period of time as the base bid price,

(d) the Work of the Contract and the Contract Price will reflect the alternatives and alternative prices, if any, accepted by the Owner at the time of the contract award, and

(e) acceptance of any alternatives will not affect the base bid contract completion time, unless we have specifically indicated an increase or decrease in time, in number of days, on account of a particular alternative.

Description of Alternative		**Effect on Base Bid**	
		Add	**Deduct**
Alternate No. 1:			
[	]:	$ _____	$ _____
	Time in days	_____	_____
Alternate No. 2:			
[	]:	$ _____	$ _____
	Time in days	_____	_____
Alternate No. 3:			
[	]:	$ _____	$ _____
	Time in days	_____	_____

Appendix D - ITEMIZED PRICES

Project /Contract:

Project/Contract No:

From (Bidder): _____

company name

We, the above-named bidder, provide below the requested breakdown of items of Work included in our bid price (as entered in the Stipulated Bid Price From). It is understood that these itemized prices are provided for information purposes only and will not be used to modify the scope of the Work or adjust our bid price. These prices do **NOT** include Value Added Taxes.

Item of Work		**Itemized Price**
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____
[	]	$ _____

Appendix E - LIST OF CASH ALLOWANCES

Project /Contract:

Project/Contract No:

From (Bidder): _____

company name

We, the above-named bidder, have provided the Cash Allowance(s) included in our base bid price (as entered in the Stipulated Price Bid Form) as requested below.

	Description of Cash Allowance			**Amount**
[	Door Hardware Allowance	]	$	9,500.00
[	Contingency Allowance	]	$	25,000.00
[		]	$	
[		]	$	
[		]	$	
[		]	$	
[		]	$	
[		]	$	
[		]	$	
[		]	$	
[		]	$	
[		]	$	

Appendix F - UNIT PRICES

Project /Contract:

Project/Contract No:

From (Bidder): _____

company name

The following are our Unit Prices for the units of work listed hereunder. The Unit Prices listed apply to performing the units of work only during the time scheduled for such work in the project schedule. These prices do **NOT** include Value Added Taxes.

Unit of Work		**Unit Price**			
			Add		**Deduct**
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____
[	]:	$	_____	$	_____

Appendix G - SEPARATE PRICES

Project /Contract:

Project/Contract No:

From (Bidder): _____

company name

We, the above-named bidder, offer below the requested separate prices. The amount to be added to, or deducted from, our base bid (as entered in the Bid Form) is entered for each requested separate price. All separate prices exclude Value Added Taxes. If there is no change to the base bid price for a separate price, we have so indicated. It is understood that:

(a) the Owner may accept any of the separate prices in any order or combination, including all or none,

(b) In accordance with the CCDC Document No. 23 - A Guide to Calling Bids and Awarding Contracts, the low bid shall be determined on the basis of the lowest tender in accordance with the Contract Documents on which the Project is to be actually constructed, including those separate prices for which prices have been invited and which are to be incorporated into the Work.

(c) Separate prices are open for acceptance by the Owner for the same period of time as the base bid price,

(d) the Work of the Contract and the Contract Price will reflect the separate prices, if any, accepted by the Owner at the time of the contract award, and

(e) acceptance of any separate prices will not affect the base bid contract completion time, unless we have specifically indicated an increase or decrease in time, in number of days, on account of a particular separate price.

Description of Separate Price		**Effect on Base Bid**	
		Add	**Deduct**
Separate Price No. 1:			
[	]:	$ _____	$ _____
	Time in days	_____	_____
Separate Price No. 2:			
[	]:	$ _____	$ _____
	Time in days	_____	_____
Separate Price No. 3:			
[	]:	$ _____	$ _____
	Time in days	_____	_____

Appendix H - TENDER RETURN LABEL

AFFIX THIS LABEL TO YOUR SUBMISSION PACKAGE ENVELOPE

Proponent to complete the following:
(Full Legal Name and Address)

NAME: _____

ADDRESS: _____

_____

_____

_____

CONTACT: _____

PHONE: _____

TENDER TITLE:
LU Chancellor Paterson Library
Teachers Common Renovation
Project No. 2017024

BID CALL DEADLINE:
Tuesday, September 12, 2017, 3:00:00pm local time.

Attn: **GEOFF MATTE, MANAGER**
PROCUREMENT and CONTRACT SERVICES
ROOM BB1002A
LAKEHEAD UNIVERSITY
955 OLIVER ROAD
THUNDER BAY, ONTARIO
P7B 5E1

IMPORTANT INSTRUCTIONS:

Tenders must be submitted in a sealed package(s) to the address indicated on the Tender Return Label between the hours of 8:30 a.m. and 4:00 p.m. (Local Time), Monday through Friday (excluding Statutory Holidays), **AND NO LATER THAN THE BID CALL DEADLINE NOTED ABOVE**.

The Owner does not accept responsibility for tender submissions directed to any location other than the address indicated on the label above. Proponents assume sole responsibility for late deliveries if these instructions are not strictly adhered to.

Failure to affix this Label to your submission envelope/ package may also result in submissions not being recognized as tenders. This could result in your tender arriving late at the prescribed office and will be deemed late, disqualified and returned to the proponent.

Tenders received by Fax or any other kind of electronic transmission will be rejected.

1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

2 GENERAL REQUIREMENTS

.1 CCDC - 2 Stipulated Price Contract 2008, as appended to this section, forms the basis of Agreement, Definitions and General Conditions between the Owner and the Contractor.

.2 The Standard Construction Document for Stipulated Price Contract, 2008, consisting of the Agreement Between Owner and Contractor, Definitions, and General Conditions of the Stipulated Price Contract, Parts 1 to 12 inclusive, governing same is hereby made part of these Contract Documents, with the following amendments, additions and modifications.

.3 Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused.

3 AGREEMENT BETWEEN OWNER AND CONTRACTOR

.1 **ARTICLE A-1 THE WORK**

.1 Add to the end of Article 1.3 the following words: "and attain Total Completion of the Work as soon as reasonably possible thereafter and in any event by the date which is 30 days following Substantial Performance of the Work."

.2 **ARTICLE A-5 - PAYMENT**

.1 Add to paragraph 5.3.1 (2) after the words in the second line: “quoted by the Royal Bank of Canada, Alloy Drive Branch, 1159 Alloy Drive, Suite 100, Thunder Bay, Ontario P7B 6M8".

.3 **ARTICLE A-6 – RECEIPT AND ADDRESSES FOR NOTICES IN WRITING**

.1 Delete Article A-6.1in its entirety.

.2 Add new Article 6.1 as follows: "Notices in Writing between the parties or between them and the Consultant shall be considered to have been received by the addressee on the date of receipt if delivered by hand or by commercial courier or if sent during normal business hours by fax and addressed as set out below. Such Notices in Writing will be deemed to be received by the addressee on the next business day if sent by fax after normal business hours or if sent by overnight commercial courier. Such Notices in Writing will be deemed to be received by the addressee on the fifth (5th) Working Day following the date of mailing, if sent by pre-paid registered post, when addressed as set out below. An address for a party may be changed by Notice in Writing to the other party setting out the new address in accordance with this Article."

.3 Add new Article 6.2 as follows: "The Notice in Writing shall be delivered to the address or fax number of the Consultant or the Owner as listed in Definitions, Section 008000 Supplementary Conditions."

.4 Add new Article 6.3 as follows: "The Notice in Writing shall be delivered to the address or fax number of the Contractor as indicated on Section 004110 Stipulated Price Bid Form."

4 DEFINITIONS

.1 Amend or supplement the Definitions as follows:

.1 Add new paragraph 3.1 as follows: "Commencement of the Work or commencing the Work means the commencement of the erection of hoarding at the Place of the Work or the mobilization of or entering into of the Place of the Work by the Contractor's forces."

.2 Add to paragraph 4 - Consultant as follows: “The word Consultant, where used in the Contract Documents means FORM Architecture Engineering, 131 Court St. N., Thunder Bay, ON P7A 4V1 Contact: Michelle Gibson, Tel: (807) 345-5582, Fax: (807) 345-4093; e-mail: Michelle.g@formarchitecture.ca.“

.3 Add at the end of paragraph 6 - Contact Documents the following words: "in writing".

.4 Add to paragraph 12 - Owner as follows:"The word Owner, where used in the contract documents shall mean Lakehead University, 955 Oliver Road, Thunder Bay, Ontario P7E 5T2 Tel: (807) 343-8455, Fax: (807) 346-7711, Contact: Geoffrey Matte, e-mail: gmatte@lakeheadu.ca"

.5 Add paragraph 13 - Project Manager as follows: "The title Project Manager, where used in the contract documents shall mean CBRE Limited, 718 Confederation Drive | Thunder Bay, ON P7E 3N4; Tel: (807) 577-0965 Contact: James McKillop, e-mail: james.mckillop@cbre.com; Cell: (807) 708-3609."

.6 Add the following as new paragraph 19.1:

.1 "19.1 Submittals

Submittals are documents or items required by the Contract Documents to be provided by the Contractor including, but not limited to:

.1 Shop Drawings, samples, models, mock-ups to indicate details or characteristics, before the portion of the Work that they represent can be incorporated into the Work; and

.2 as-Built drawings and manuals to provide instructions to the operation and maintenance of the Work.

.7 Delete paragraph 20 and replace with the following:

.1 "20. Substantial Performance of the Work

Substantial Performance of the Work means the occurrence of each of the following:

.1 the Consultant has certified that:

.1 the Contract is substantially performed within the meaning of subsection 2(1) of the Construction Lien Act (Ontario) (or the equivalent section of the lien legislation applicable to the Place of the Work); or

.2 if any such legislation is not in force or does not contain such definition, the Work is ready for use or is being used for the purposes intended and is capable of completion or, where there is a known defect, correction, at a cost of not more than, (A) 3 per cent of the first $500,000 of the Contract Price, (B) 2 per cent of the next $500,000 of the Contract Price, and (C) 1 per cent of the balance of the Contract Price; and

.2 all Work which has been completed, has been performed to the requirements of the Contract Documents, including, without limitation, substantially in accordance with all drawings and specifications therefor and is so certified by the Consultant; and

.3 the Contractor has obtained and delivered to the Consultant and the Owner clear inspection reports from all authorities having jurisdiction with respect to any component of the Work which has been completed; and

.4 the Consultant has tested or caused to be tested the Work and verified to the Owner that all mechanical, electrical, plumbing, heating, ventilating, air-conditioning, security, life and safety, elevator and other building operating systems are in proper working order in accordance with the Contract Documents. Without limiting the generality of the foregoing, all applicable building systems shall have been air and fluid balanced and the Consultant shall have received, reviewed and confirmed its acceptance of reports with respect to such balancing; and

.5 all turnover stock, materials and equipment is located at the Place of the Work and has been inspected by the Consultant and the Consultant has confirmed its acceptance of the same by written notice to the Owner and the Contractor and such turnover stock, materials and equipment shall have been effectively delivered to the Owner by the Contractor; and

.6 the Contractor shall have provided to the Owner and the Consultant emergency contact information for the Contractor and each Supplier and Subcontractor which will allow the Owner to contact and obtain assistance from any of such persons on a 24-hour basis in the event of any emergency at the Project; and

.7 the Contractor shall have provided to the Owner and the Consultant a summary of all guarantees and warranties received or to be received by the Contractor from any Subcontractors and Suppliers and copies of such warranties and guarantees to the extent received; and

.8 the Contractor shall have prepared and delivered to the Consultant and the Owner a "punch list" of all items of the Work which are incomplete, outstanding, deficient or defective and remain to be completed or rectified with projected completion dates for each item specified and such list shall be acceptable to the Owner and the Consultant; and

.9 the Consultant shall have reviewed the "punch list" and shall have provided its report to the Owner and the Contractor as to the cost to complete the outstanding items specified therein; and

.10 the Contractor shall have prepared and delivered to the Consultant Closeout Documents in accordance with other Sections and

.11 the Contractor shall have provided clear and adequate demonstration and training on the use and maintenance of new or altered equipment and controls. To the satisfaction of the Owner; and,

.12 an occupancy certificate shall have been issued in respect of the Project, if applicable."

.8 Requirements are in addition to the related requirements of the contract specified elsewhere in the contract documents and do not supercede them and where they may be in conflict the more stringent requirements apply.

5 GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

.1 GC1.1 Contract Documents:

.1 Add to the end of paragraph 1.1.2.2 as follows: “except where the Consultant shall be indemnified as a third party beneficiary as provided in paragraphs 9.2.7.4, 9.2.8.4, 9.5.2.4 and 9.5.3.4 and in 12.1.1.”

.2 Delete paragraph 1.1.7.1 in its entirety.

.3 Add new paragraph 1.1.7.1 as follows:

“.1 the order of priority of documents, from highest to lowest, shall be
- Supplementary Conditions,
- the Agreement between the Owner and the Contractor,
- the Definitions,
- the General Conditions,
- Division 1 of the Specifications,
- technical Specifications,
- material and finishing schedules,
- the Drawings."

.4 Add new paragraph 1.1.7.5 as follows: The Contractor shall exercise full precaution to verify figures shown on the Drawings before laying out of work, and is responsible for errors resulting from failure to exercise such precaution.

.5 Add new paragraph 1.1.7.6 as follows: “The Drawings referred to in the Specification represent generally, the nature and extent of the work to be executed. Where certain work is shown on the drawings but is not described in the specifications, the Contractor shall include such work in the Contract Price in accordance with a reasonable standard of acceptance based on projects of a similar nature or type. Prior to executing the Work the Contractor shall draw the matter to the attention of the Consultant and identify its proposed standard of acceptance. Should the Consultant or the Owner require a higher standard, a Change Order shall be issued adjusting the Contract Price accordingly.”

.6 Add new paragraph 1.1.7.7 as follows: “In the case of any item of Work being called for under the heading of two or more Specification sections, the Contractor shall decide under which of these sections the Work is to be performed.

.7 Add new paragraph 1.1.7.8 as follows: “In case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the Contract Documents.

.8 Add new paragraph 1.1.11 as follows: “The Contractor shall notify the Consultant in writing of omissions or discrepancies in the Contract Documents requesting clarification prior to proceeding with affected work.”

.9 Add new paragraph 1.1.12 as follows: “If Work is required in a manner which, in the Contractor’s opinion, makes it impossible to produce satisfactory first class work, the Contractor shall request clarification or direction from the Consultant before proceeding with the Work. Failure to make such a request cannot thereafter be relied on by the Contractor for failing to carry out the Work in a satisfactory first class manner.”

.10 Add new paragraph 1.1.13 as follows: "The Contractor and its Subcontractors are required to take note of all existing site and/or building features visible at the time of tender which may affect the Work and to account for all associated work, whether or not such work is specifically indicated in the Contract Documents, required to accommodate the existing site and/or building so as to achieve the design as required in the Contract. In the case of existing conditions not accounted for in the Contract Documents, the Contractor shall propose to the Consultant a reasonable solution to accommodate the existing site conditions, which can be completed at no increase to the Contract Price. Should the Consultant require other work in addition to that which the Contractor proposes, a Change Order shall be issued increasing the Contract Price accordingly."

.2 GC 2.2 Role of the Consultant

.1 Add the word "schedules" after the word "techniques" in paragraph 2.2.6.
.2 Add to the end of the second sentence of paragraph 2.2.6. "or to adhere to the construction schedule."
.3 Add at the end of paragraph 2.2.9 “The Owner and the Contractor shall waive any claims against the Consultant arising out of the making of such interpretations and findings in accordance with paragraphs 2.2.7, 2.2.8 and 2.2.9.”
.4 Add the following new sentence at end of paragraph 2.2.11: "The Consultant's obligation to make findings on a large claim or large number of claims is subject to the terms and conditions of the Owner/Consultant agreement."
.5 Add at the end of paragraph 2.2.16 the words "and the date of completion of the Work as provided in GC 5.7 - FINAL PAYMENT."

.3 GC 2.4 Defective Work

.1 Add the following sentence to paragraph 2.4.1: "GC 12.3.3, GC 12.3.4 and GC 12.3.5 shall take precedence over GC 2.4 where any conflict may exist."
.2 Add new paragraph 2.4.1.1 as follows: "The Contractor shall rectify, in a manner acceptable to the Owner and the Consultant, all defective work and deficiencies throughout the Work, whether or not they are specifically identified by the Consultant."
.3 Add new paragraph 2.4.1.2 as follows: "The Contractor shall prioritize the correction of any defective Work in accordance with the instructions of the Owner, acting in its sole discretion."
.4 Delete paragraph 2.4.3 in its entirety.
.5 Add new paragraph 2.4.3 as follows: "If in the opinion of the Consultant it is not expedient to correct defective work or work not performed as provided in the Contract Documents, the Owner may deduct from the amount otherwise due to the Contractor the greater of (i) the difference in value between the work as performed and that called for by the Contract Documents and (ii) the cost to rectify the defective or substandard work. If the Owner and the Contractor do not agree on the difference in value or the cost to rectify the work, they shall refer the matter to the Consultant for determination."

.4 GC 3.1 Control of the Work

.1 Add the word "schedules" after the word "techniques" in paragraph 3.1.2.
.2 Add new paragraph 3.1.3 as follows: Prior to commencing individual procurement, fabrication and construction activities, the Contractor shall verify, at the Place of the Work, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the Work and shall further carefully compare such field measurements and conditions with the requirements of the Contract Documents. Where dimensions are not included or exact locations are not apparent, the Contractor shall immediately notify the Consultant in writing and obtain written instructions from the Consultant before proceeding with any part of the affected Work.
.3 Add new paragraph 3.1.4. as follows: The Contractor shall provide for the co-ordination of the activities and work of other contractors and Owner’s Own Forces with the Work of the contract.

.5 GC 3.2 Construction by Owner or other Contractors

.1 Delete paragraph 3.2.2.1 in its entirety.
.2 Delete paragraph 3.2.2.2 in its entirety.
.3 Add the following sentence to the end of paragraph 3.2.2.4: “The Owner may elect to transfer the responsibility for the “Broad Form” Property Insurance as indicated in CCDC 41 to the Contractor. The Contractor’s additional cost of

insurance premiums as levied by the Contractor's Insurer is to be based on the value of the Owner's contract. A Change Order shall be issued increasing the Contract Price accordingly.

.4 Add new paragraph 3.2.3.4 as follows: "subject to GC 9.4 CONSTRUCTION SAFETY, for the Owner's Own Forces and for other contractors, assume overall responsibility for compliance with all aspects of the applicable health and safety legislation in the Place of the Work, including all of the responsibilities of the "constructor", "prime contractor" or other comparable designation under the Occupational Health and Safety Act. The following is a list of Work performed by other contractors or the Owner's Own Forces:
- .1 Work 1: data and telephone systems (final terminations only)
- .2 Work 2: Owners security system (conduit installed by contract)
- .3 Work 3: LU / TSC staff to review on site at beginning of the rough-in stage and confirm locations of mounting panels, electrical & data drops.
- .4 Work 4: Owners custodial and maintenance staff are to be allowed access as required to areas within the project site.

.5 Add new paragraph 3.2.3.5 as follows: "as applicable, maintain free and unencumbered access for the Owner as is reasonably practicable to service doors and other entrances at all times following occupancy of the Work, provided that the Owner shall comply with such reasonable rules and regulations, including safety and security precautions, as the Contractor may stipulate with respect to the Place of the Work, the particulars of which shall be provided to the Owner and the Consultant and to all persons on or about the Place of the Work."

.6 GC 3.4 Document Review

.1 Delete paragraph 3.4.1 in its entirety.

.2 Add new paragraph 3.4.1 as follows: "The Contractor shall review the Contract Documents and shall report promptly to the Consultant any error, inconsistency or omission the Contractor may discover. Such review by the Contractor shall comply with the standard of care described in paragraph 3.14.1 of the Contract. Except for its obligation to make such review and report the result, the Contractor does not assume any responsibility to the Owner or to the Consultant for the accuracy of the Contract Documents. The Contractor shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the Contract Documents, which the Contractor could not reasonably have discovered. If the Contractor does discover any error, inconsistency or omission in the Contract Documents, the Contractor shall not proceed with the work affected until the Contractor has received corrected or missing information from the Consultant."

.3 Add new paragraph 3.4.2 as follows: "If the Contractor finds errors, inconsistencies, discrepancies and/or omissions from the Contract Documents or has any doubt as to the meaning or intent of any part thereof, the Contractor must immediately notify the Consultant, who will provide written instructions or explanations. Neither the Owner nor the Consultant will be responsible for oral instructions."

.7 GC 3.5 Construction Schedule.

.1 Delete paragraph 3.5.1 in its entirety.

.2 Add new paragraph 3.5.1 as follows:

"The Contractor shall,

3.5.1.1: Prior to submitting the first application for payment, submit to the Owner and the Consultant for their review and acceptance a construction schedule indicating the critical path for the Project demonstrating that the Work will be performed in conformity with the Contract Time and in accordance with the Contract Documents. The Contractor shall provide the schedule information required by this paragraph in both electronic format and hard copy. Once accepted by the Owner and the Consultant, the construction schedule submitted by the Contractor shall become the baseline construction schedule;

3.5.1.2: Provide the expertise and resources, such resources including manpower and equipment, as are necessary to maintain progress under the accepted baseline construction schedule referred to in paragraph 3.5.1.1 or any successor or revised schedule accepted by the Owner pursuant to GC3.5;

3.5.1.3: Monitor the progress of the Work on a weekly basis relative to the construction schedule reviewed and accepted pursuant to paragraph 3.5.1.1, or any successor or revised schedule accepted by the Owner

pursuant to GC 3.5, update the schedule on a monthly basis and advise the Consultant and the Owner in writing of any variation from the baseline or slippage in the schedule; and

3.5.1.4: If, after applying the expertise and resources required under paragraph 3.5.1.2, the Contractor forms the opinion that the slippage in schedule reported in paragraph 3.5.1.3 cannot be recovered by the Contractor, it shall, in the same notice provided under paragraph 3.5.1.3, indicate to the Consultant and the Owner if the Contractor intends to apply for an extension of Contract Time as provided in PART 6 - CHANGES IN THE WORK."

.3 Add new paragraph 3.5.2 as follows: "If at any time it should appear to the Owner or the Consultant that the actual progress of the Work is behind schedule or is likely to become behind schedule, based on critical path methodology, or if the Contractor has given notice of such to the Owner or the Consultant pursuant to 3.5.1.3, the Contractor shall take appropriate steps to cause the actual progress of the Work to conform to the schedule and shall produce and present to the Owner and the Consultant a recovery plan demonstrating how the Contractor will achieve the recovery of the schedule. If the Contractor intends to apply for a change in the Contract Price in relation to a schedule recovery plan, the Contractor shall proceed with PART 6 – CHANGES IN THE WORK."

.8 GC 3.6 Supervision.

.1 Delete paragraph 3.6.1 in its entirety.

.2 Add new paragraph 3.6.1 as follows: "The Contractor shall provide all necessary supervision and appoint competent representatives who shall be in attendance at the Place of the Work while work is being performed. The appointed representatives shall not be changed except for valid reasons, and upon the Contractor obtaining the Consultant's written consent, which consent will not be unreasonably withheld."

.3 Add new paragraph 3.6.3 as follows: "The Owner may, at any time during the course of the Work, request the replacement of the appointed representative(s), where the grounds for the request involve conduct which jeopardizes the safety of the Owner's operations. Immediately upon receipt of the request, the Contractor shall make arrangements to appoint an acceptable replacement."

.9 GC 3.7 Subcontractors and Suppliers.

.1 Add new paragraph 3.7.2.1 as follows: "The Contractor agrees not to change Subcontractors without prior written approval of the Owner, which approval will not be unreasonably withheld."

.10 GC 3.8 Labour and Products.

.1 Add new paragraph 3.8.4 as follows: "The Contractor is responsible for the safe on-site storage of Products and their protection (including Products supplied by the Owner and other contractors to be installed under the Contract) in such ways as to avoid dangerous conditions or contamination to the Products or other persons or property and in locations at the Place of the Work to the satisfaction of the Owner and the Consultant. The Owner shall provide all relevant information on the Products to be supplied by the Owner."

.11 GC 3.9 Documents at the Site

.1 Delete paragraph 3.9.1 in its entirety.

.2 Add new paragraph 3.9.1 as follows: "The Contractor shall keep one copy of the current Contract Documents, Supplemental Instructions, Contemplated Change Orders, Change Orders, Change Directives, Cash Allowance Disbursement Authorizations, reviewed Shop Drawings, Submittals, reports and records of meetings at the Place of the Work, in good order and available to the Owner and Consultant."

.12 GC 3.10 Shop Drawings.

.1 Add the words "AND OTHER SUBMITTALS" to the title after "SHOP DRAWINGS".

.2 Add "and Submittals" after the words "Shop Drawings" in paragraphs 3.10.1, 3.10.2, 3.10.4, 3.10.7, 3.10.8, 3.10.8.2, 3.10.9, 3.10.10, 3.10.11 and 3.10.12.

.3 Delete 3.10.3 in its entirety.

.4 Add new paragraph 3.10.3 as follows: "Prior to the first application for payment, the Contractor shall prepare a schedule of the dates for provision, review and

return of Shop Drawings and Submittals and submit it to the Consultant for review. The schedule is to allow the Consultant a maximum of ten (10) Calender Days for the review of Shop Drawings and seven (7) Calender Days for the review of Submittals."

.5 Delete paragraph 3.10.12 in its entirety.

.6 Add new paragraph 3.10.12 as follows: "The Consultant will review and return Shop Drawings and Submittals in accordance with the schedule agreed upon in 3.10.3, or, in the absence of such schedule, within a maximum of ten (10) Calender Days and Submittals within a maximum of seven (7) Calender Days, or, in the absence of such schedule, with reasonable promptness. If, for any reason, the Consultant cannot process them within the agreed-upon schedule or with reasonable promptness, the Consultant shall notify the Contractor and they shall meet to review and arrive at an acceptable revised schedule for processing. The Contractor shall update the Shop Drawings and Submittals Schedule to correspond to changes in the construction schedule. Changes in the Contract Price or Contract Time may be made only as otherwise provided in the Contract."

.13 GC 3.11 Use of the Work.

.1 Add new paragraph 3.11.3 as follows: "The Contractor shall allot suitable and proper space to Subcontractors for the storage of their materials."

.2 Add new paragraph 3.11.4 as follows: "The Contractor and all Subcontractors will not be permitted to use permanent site and building equipment such as plumbing, ventilating, heating and conveyance systems without written approval of the Owner, except as noted in General and Supplementary Conditions."

.14 GC 3.12 Cutting and Remedial Work

.1 Add new paragraph 3.12.5 as follows: "The Contractor or any Subcontractor whose work, in whole or in part is defective shall correct all deficiencies at its own expense."

.2 Add new paragraph 3.12.6 as follows: "The Contractor or Subcontractor who damages work of other Subcontractors or the Contractor shall be responsible for its repair at its own expense."

.3 Add new paragraph 3.12.7 as follows: All cutting, patching, finishing, refinishing or restoring required and costs of such work shall be considered part of the scope of work of the Specification section for the work which created the above requirement."

.15 Add new GC 3.14 "Performance by Contractor" as follows:

.1 Add new paragraph 3.14.1 as follows: "In performing its services and obligations under the Contract, the Contractor shall exercise a standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The Contractor acknowledges and agrees that throughout the Contract, the Contractor's obligations, duties and responsibilities shall be interpreted in accordance with this standard. The Contractor shall exercise the same standard of due care and diligence in respect of any Products, personnel, or procedures which it may recommend to the Owner."

.2 Add new paragraph 3.14.2 as follows: "The Contractor further represents, covenants and warrants to the Owner that:

.1 The personnel it assigns to the Project are appropriately experienced;

.2 It has a sufficient staff of qualified and competent personnel to replace its designated supervisor and project manager, subject to the Owner's approval, in the event of death, incapacity, removal or resignation; and

.3 There are no pending, threatened or anticipated claims that would have a material effect on the financial ability of the Contractor to perform its work under the Contract."

.16 Add new GC 3.15 "Right of Entry" as follows:

.1 Add new paragraph 3.15.1 as follows: "The Owner shall have the right to enter or occupy the Work in whole or in part for the purpose of placing fittings and equipment or for other uses before Substantial Performance of the Work, if, in the opinion of the Consultant and Contractor, such entry or occupation does not prevent or substantially interfere with the Contractor in completion of the Contract within the Contract Time. Such entry or occupation shall not be considered as acceptance of the Work or in any way relieve the Contractor from responsibility to complete the Contract."

.17 GC 4.1 Cash Allowances

.1 Delete paragraph 4.1.4 in its entirety.
.2 Add new paragraph 4.1.4 as follows: “Where the actual cost of the Work under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the Consultant’s direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the Contract Price for overhead and profit. Only where the actual cost of the Work under all cash allowances exceeds the total amount of all cash allowances shall the Contractor be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the Contract Documents.”
.3 Delete paragraph 4.1.5 in its entirety.
.4 Add new paragraph 4.1.5 as follows: “The net amount of any unexpended cash allowances, after providing for any reallocation as contemplated in paragraph 4.1.4, shall be deducted from the Contract Price by Change Order without any adjustment for the Contractor's overhead and profit on such amount.”
.5 Delete paragraph 4.1.7 in its entirety.
.6 Add new paragraph 4.1.7 as follows: “The Contractor shall prepare a schedule that shows when the Owner must authorize ordering of items called for under cash allowances to avoid delaying the progress of the Work.”
.7 Add new paragraph 4.1.8 as follows: “The Owner reserves the right to call, or to have the Contractor call, for competitive bids for portions of the Work to be paid for from cash allowances.”

.18 GC 5.2 Applications for Progress Payment

.1 Add to the end of paragraph 5.2.7 the following new sentence: “Any Products delivered to the Place of the Work but not yet incorporated into the Work shall remain at the risk of the Contractor notwithstanding that title has passed to the Owner pursuant to GC 13.1 OWNERSHIP OF MATERIALS.”
.2 Add new paragraph 5.2.8 as follows: Each application for payment after the first payment shall be accompanied by a Statutory Declaration, on CCDC Form 9A-2001, by a responsible officer of the Contractor, stating that the Contractor’s Subcontractors and Suppliers have been paid in full for work previously certified for payment by the Consultant except for legitimate reductions permitted under the Construction Lien Act.”
.3 Add new paragraph 5.2.9 as follows: “The Contractor shall submit Workplace Safety & Insurance Board Clearance Certificate, with each application for progress payment.”
.4 Add new paragraph 5.2.10 as follows: “The Contractor shall prepare and maintain current as-built Drawings which shall consist of the Drawings and Specifications revised by the Contractor during the Work, showing changes to the Drawings and Specifications, which current as-built Drawings shall be maintained by the Contractor and made available to the Consultant for review with each application for progress payment. The Consultant reserves the right to retain a reasonable amount for the value of the as-built Drawings not presented for review.”

.19 GC 5.3 Progress Payment

.1
.2 Delete from the first line of paragraph 5.3.1.2, the words “calendar days” and substitute the words: “Working Days”.
.3 Delete paragraph 5.3.1.3 in its entirety.
.4 Add new paragraph 5.3.1.3 as follows: “The Owner shall make payment to the Contractor on account as provided in Article A-5 of the Agreement – PAYMENT no later than ten (10) Working Days after the date of a certificate of payment issued by the Consultant.”
.5 Add new paragraph 5.3.2 as follows: “The Consultant may withhold on account of subsequently discovered information, or nullify the whole or part of any Certificates for Payment, to such an extent as may be necessary to protect the Owner from loss of account of:
.1 Defective Work not remedied;
.2 Claims filed or reasonable evidence indicated probable filing for claims;
.3 Failure of Contractor to make payment promptly to Subcontractor for materials or labour;
.4 A reasonable doubt that the contract can be completed for the balance then unpaid;
.5 Damage to any other contractor separately retained by the Owner on the Project.

.6 Add new paragraph 5.3.3 as follows: "When all concerns outlined in paragraph 5.3.2 have been addressed, Certificates of Payment shall forthwith be issued in respects of amounts withheld due to such concerns."

.20 GC 5.4 Substantial Performance of the Work

.1 Delete paragraph 5.4.3 in its entirety.

.2 Add new paragraph 5.4.3 as follows: "Immediately following the issuance of the certificate of Substantial Performance of the Work, the Contractor, in consultation with the Consultant, shall establish reasonable dates for finishing the Work and correcting deficient work."

.3 Add new paragraph 5.4.4 as follows: "The Contractor shall publish, in the "Daily Commercial News" Construction Trade Journal, a copy of the Certificate of Substantial Performance of the Work within seven (7) days of receiving a copy of the Certificate signed by the Consultant, and the Contractor shall provide suitable evidence of the publication to the Consultant and Owner. If the Contractor fails to publish such notice, the Owner shall be at liberty to publish and back charge the Contractor its reasonable costs for doing so. The precise date of "Substantial Performance of the Work" shall be the certified date of publication in the "Daily Commercial News" Construction Trade Journal."

.4 Add new paragraph 5.4.5 as follows: Prior to submitting its application for Substantial Performance of the Work , the Contractor shall submit to the Consultant all:

.1 guarantees;
.2 warranties;
.3 certificates;
.4 testing and balancing reports;
.5 distribution system diagrams;
.6 spare parts;
.7 maintenance manuals and
.8 other materials or documentation required to be submitted under the Contract, together with written proof acceptable to the Owner and the Consultant that the Work has been substantially performed in conformance with the requirements of municipal, government and utilities authorities having jurisdiction."

.5 Add new paragraph 5.4.6 as follows: "Where the Contractor is unable to deliver the documents and materials described in paragraph 5.4.5, then, provided that none of the missing documents and materials interferes, in a material way, with the use and occupancy of the Work, failure to deliver shall not be grounds for the Consultant to refuse to certify Substantial Performance of the Work. Any documents or materials not delivered in accordance with paragraph 5.4.5 shall be delivered as provided in GC 5.7, paragraph 5.7.1."

.6 Add new paragraph 5.4.7. as follows: "The Owner will withhold 10% of each progress payment and the total of all percentage payments withheld will be released 45 days after Substantial Performance of the Work except the Owner will withhold, in addition, a sufficient amount of money to cover the cost of completing defective or deficient Work including such Work that may be discovered after Substantial Completion.

.21 GC 5.5 Payment of Holdback upon Substantial Performance of the Work

.1 Add new paragraph 5.5.1.3. as follows: "Submit a written request for release of holdback including a declaration that no written notices of lien have been received by it."

.2 Add new paragraph 5.5.1.4. as follows: "Submit a Statutory Declaration CCDC 9A-2001."

.3 Add new paragraph 5.5.1.5. as follows: "Submit Workplace Safety & Insurance Board Clearance Certificate."

.4 Delete from line 1 of paragraph 5.5.2, the words "the statement" and substitute the words "the documents".

.22 GC 5.6 Progressive Release of Holdback

.1 Add new paragraph 5.6.4 as follows: "For release of holdback on subcontract work which is 100% complete, prior to final payment, the Contractor shall make application by written request for a review to determine the date of completion of the subcontract and shall submit such supporting material as the Consultant may in his discretion require, and may include statutory declarations from such persons and dealing with such matters as the Consultant requires. Such material shall in any event include:

.1 Description of the scope of work included in the subcontract.

.2 Declaration of Last Supply by the Subcontractor as prescribed in subsection 31(5) of the Act (Form 5);
.3 Certificate of Completion of Subcontract as prescribed in subsection 33(1) of the Act (Form 7);
.4 Workplace Safety & Insurance Board clearance certificate for the Contractor, the Subcontractor concerned, and any other subcontractors and suppliers who have provided any services to the Subcontractor.
.5 Statutory declaration by an officer of the Subcontractor in the form CCDC Document 9B - 2001;
.6 Contractor's written acknowledgement to the Owner that the requirements of the Contract Documents will not be altered by early release of the holdback of the completed subcontracts;
.7 Confirmation by the bonding company that it has been notified of the intent to claim early release of holdback and does not object."

.23 GC 5.7 Final Payment

.1 Delete paragraph 5.7.1 in its entirety.
.2 Add new paragraph 5.7.1 as follows: "When the Contractor considers that the Work is completed, the Contractor shall submit an application for final payment. The Contractor's application for final payment shall be accompanied by any documents or materials not yet delivered pursuant to paragraph 5.4.5 together with complete as-built Drawings. Should the Contractor fail to deliver any of the foregoing documents, the Owner shall be at liberty to withhold from amounts otherwise payable to the Contractor, the sum of **Five Thousand Dollars ($5,000.00)** as security for the obligation of the Contractor to deliver the undelivered documents."
.3 Delete from the first line of paragraph 5.7.2 the words "calendar days" and substitute the words: "Working Days".
.4 Delete from the first line of paragraph 5.7.4 the words "calendar days" and substitute the words: "Working Days".
.5 Add new paragraph 5.7.5 as follows: "As additional requirements for release of finishing construction lien holdback, the Contractor shall submit the following documentation:
.1 Contractor's written request for release of holdback, including a declaration that no written notices of lien have been received by it.
.2 Contractor's Statutory Declaration CCDC 9A-2001;
.3 Contractor's Workplace Safety & Insurance Board Clearance Certificate."
.6 Add new paragraph 5.7.6 as follows: "Final payment, constituting the balance of the Contract, will not be made until all defective Work has been remedied and verified to the satisfaction of the Consultant. Payment will be made only when application for same is made by Contractor.
.7 Add new paragraph 5.7.7 as follows: "The term "Date of Completion of the Contract" shall be the date all is completed as set forth in the Contract; all other terms of the Contract Documents have been fulfilled, and the Consultant has furnished to the Owner, a final Certificate for Payment."
.8 Add paragraph 5.7.8 as follows: The Contractor shall ensure that the Work is protected pending the issuance of the final Certificate for Payment and be responsible for the correction of defects in it regardless of whether or not they were apparent when such certificates were issued."

.24 GC 6.1 Owner's Right to Make Changes

.1 Add the following as a new last sentence of paragraph 6.1.2: " Owner shall accept or reject all Change Orders within five (5) Working Days from the date in which the same are submitted (with complete unit pricing and quantity survey information) to it by the Consultant."
.2 Add new paragraph 6.1.3 as follows: "Unless otherwise agreed in writing by Owner and Contractor, any authorized increase in the cost of the Work shall be computed at rates not higher than actual cost of labour and materials for similar work in the vicinity of the Project, plus an amount equal to that stipulated in GC6.2, paragraph 6.2.3.2. For clarity, any calculations of overhead and profit arising from Change Orders or Change Directives will only apply to the net increase in Contract Price after any credits associated with specific changes are applied."
.3 Add new paragraph 6.1.4 as follows: The Contractor and Owner will be required to use the Consultants web based contract administration program "R-Forms" by Re-Form Technologies Ltd. The program will be used for the issuing of Proposed Change Orders, Change Orders, RFI's, Supplementary Instructions, Progress Claims, Shop Drawing submissions and other forms as may be required.

Contractors and Owners not familiar with this program will be provided with a free tutorial on the access and operation of the system. R-Forms does not require signatures for the approval of documents. **The Contractor and the Owner hereby agree that the Owners selection of the "ACCEPT" function of the electronic form of Change Order as issued by the Consultant on the web based R-Form platform is equivalent to having a hard copy of the Change Order signed by the Owner and that this meets the conditions of GC 6.2.2 of the CCDC2 Stipulated Price Contract 2008.**

.25 GC 6.2 Change Order

.1 Add new paragraph 6.2.3 as follows: "The Contractor shall present to the Consultant an itemized and detailed list of the material and labour costs of expenditure and savings forming net costs to perform the Work attributable to the change. A percentage allowance for overhead and profit shall be added to the net costs of the change and shall be calculated as follows:

.1 Credits: no overhead and profit is permitted to be added, the original overhead and profit is not required to be credited.

.2 Extras: the percentages to be applied to the net cost increase to the Contract Price shall be as follows:

.1 Contractor's own work: Overhead at 10% of the net cost + Profit at 5% of the net cost (total 15% increase);

.2 Subcontractor's own work: Overhead at 5% of the net cost + Profit at 5% of the net cost(total 10% increase);

.3 Contractors allowance on Subcontractor's work: Profit at 5% of the Subcontractor's net cost.

.2 Add new paragraph 6.2.4 as follows: "The eligible costs of performing the Work attributable to the Change Order shall be limited to the items as set out in GC 6.3.7.1 to GC 6.3.7.18 as amended."

.26 **GC 6.3 Change Directive**

.1 Add new paragraph 6.3.7.18 as follows: "A percentage allowance for overhead and profit shall be added to the net costs of the change and shall be calculated in accordance with paragraph 6.2.3."

.27 GC 6.4 Concealed or Unknown Conditions

.1 Add new paragraph 6.4.5 as follows: "The Contractor confirms that, prior to bidding the Project, it carefully investigated the Place of the Work and applied to that investigation the degree of care and skill described in paragraph 3.14.1, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the Contractor prior to submission of bid, and the sufficiency and completeness of the information provided by the Owner. The Contractor is not entitled to compensation or to an extension of the Contract Time for conditions which could reasonably have been ascertained by the Contractor by such careful investigation undertaken prior to the submission of the bid and as described in GC1.1.13."

.28 GC 6.5 Delays

.1 Delete the period at the end of paragraph 6.5.1, and substitute the words: ", but excluding any consequential, indirect or special damages."

.2 Add new paragraph 6.5.1.1 as follows: "In the case of a Delay Claim, the Contractor is to use the Critical Path Method as laid out in the Master Plan to clearly document the critical tasks and the effect of the delay on the completion of these tasks. Each claim is to be accompanied by all documentation necessary including but not limited to all labour, materials, equipment and transportation costs to substantiate the claim.

.3 Delete the period at the end of paragraph 6.5.2, and substitute the words: ", but excluding any consequential, indirect or special damages."

.4 Add new paragraph 6.5.6 as follows: If the Contractor is delayed in the performance of the Work by an act or omission of the Contractor or anyone employed or engaged by the Contractor directly or indirectly, or by any cause within the Contractor's control, then the Contract Time shall be extended for such reasonable time as the Consultant may decide in consultation with the Contractor. The Owner shall be reimbursed by the Contractor for all reasonable costs incurred by the Owner as the result of such delay, including all services required by the Owner from the Consultants as a result of such delay by the Contractor and, in particular, the cost of the Consultant's services during the period between the date of Substantial Performance of the Work stated in Article A-1 herein as the same may be extended through the provisions of these General Conditions

and any later, actual date of Substantial Performance of the Work achieved by the Contractor.

.29 GC 6.6 Claims for a Change In Contract Price

.1 Delete paragraph 6.6.5. in its entirety.

.2 Add paragraph 6.6.5 as follows: The Consultant's findings, with respect to a claim made by either party will be given by Notice in Writing by the Consultant to both parties within reasonable time after receipt of the claim information noted in paragraph 6.6.3.

.3 Add new paragraph 6.6.7 as follows: "The Owner may, at the request of the Consultant, make claims arising out of the costs incurred for additional services provided by the Consultant resulting from the Contractor's failure to reasonably perform the Work in accordance with the terms and conditions of the Contract, including the Contractor's issuance of unnecessary Requests For Information. The Consultant will notify the Owner and Contractor where it has been determined that additional services will be required or have been provided in order not to cause a delay. The Owner shall make claims based on the Consultant's invoices."

.30 Add new "GC 7.3 Owner's Right to Suspend the Work or Terminate the Contract Without Cause" as follows:

.1 Add new paragraph 7.3.1 as follows: "The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine. The Contract Price and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described below. Adjustment of the Contract Price shall not include profit. No adjustment shall be made to the extent:

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract."

.2 Add new paragraph 7.3.2.1 as follows: "The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause effective upon Notice in Writing to the Contractor."

.3 Add new paragraph 7.3.2.2 as follows: "Upon receipt of Notice in Writing from the Owner of such termination for the Owner's convenience, the Contractor shall:

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders."

.4 Add new paragraph 7.3.2.3 as follows: "In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work completed through the date of Owner's notice and not thereafter."

.31 GC 8.1 Authority of the Consultant

.1 Delete last sentence of paragraph 8.1.3 and substitute the following sentence: "If it is subsequently determined that such instructions were at variance with the Contract Documents, the Owner shall pay the Contractor costs incurred by the Contractor in carrying out such instructions which the Contractor was required to do beyond the requirements of the Contract Documents, including costs resulting from interruption of the Work."

.32 **GC 8.2 Negotiation, Mediation and Arbitration**

.1 Revise the heading, "**GC 8.2 Negotiation, Mediation and Arbitration**" to read, "**GC 8.2 Negotiation and Mediation**".

.2 Delete paragraphs 8.2.6, 8.2.7, and 8.2.8 in their entirety.

.33 GC 9.1 Protection of Work and Property

.1 Delete paragraph 9.1.1.1 in its entirety.

.2 Add new paragraph 9.1.1.1 as follows: "errors in the Contract Documents which the Contractor could not have discovered applying the standard of care described in paragraph 3.14.1;"

.3 Delete paragraph 9.1.2 in its entirety.

.4 Add new paragraph 9.1.2 as follows: “Before commencing any Work, the Contractor shall determine the locations of all underground utilities and structures indicated in or reasonably determinable from the Contract Documents, or that are reasonably determinable from an inspection of the Place of the Work exercising the degree of care and skill described in paragraph 3.14.1.”

.34 GC 9.2 Toxic and Hazardous Substances

.1 Add to paragraph 9.2.6 after the word "responsible", the following new words: "or whether any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner or others,"

.2 Add "and the Consultant" after the word "Contractor" in paragraph 9.2.7.4.

.3 Add to paragraph 9.2.8 after the word "responsible", the following new words: "or that any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner or others,"

.4 Add "and the Consultant" after the word "Owner" in paragraph 9.2.8.4.

.35 GC 9.4 Construction Safety

.1 Delete paragraph 9.4.1 in its entirety.

.2 Add new paragraph 9.4.1 as follows: "The Contractor shall be solely responsible for construction safety at the Place of the Work and for compliance with the rules, regulations and practices required by the applicable construction health and safety legislation and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work."

.3 Add new paragraph 9.4.2 as follows: "Prior to the Commencement of the Work, the Contractor shall submit to the Owner:

.1 a current WSIB clearance certificate;

.2 copies of the Contractor's insurance policies having application to the Project or certificates of insurance, at the option of the Owner;

.3 documentation of the Contractor's in-house safety related programs;

.4 a copy of the Notice of Project filed with the Ministry of Labour naming itself as "constructor" under the Occupational Health and Safety Act."

.4 Add new paragraph 9.4.3 as follows: "The Contractor shall indemnify and save harmless the Owner, its agents, officers, directors, employees, consultants, successors and assigns from and against the consequences of any and all safety infractions committed by the Contractor under the Occupational Health and Safety Act, including the payment of legal fees and disbursements on a solicitor and client basis. Such indemnity shall apply to the extent to which the Owner is not covered by insurance, provided that the indemnity contained in this paragraph shall be limited to costs and damages resulting directly from such infractions and shall not extend to any consequential, indirect or special damages."

.5 Add new paragraph 9.4.4 as follows: "The Owner undertakes to include in its contracts with other contractors and/or in its instructions to its own forces the requirement that the other contractor or own forces, as the case may be, will comply with directions and instructions from the Contractor with respect to occupational health and safety and related matters. The text of such instruction is attached to these Supplementary Conditions as Schedule A."

.36 GC 9.5 Mould

.1 Add “and the Consultant” after “Owner” in paragraph 9.5.2.4.

.2 Add “and the Consultant” after “Contractor” in paragraph 9.5.3.4.

.37 GC 10.2 Laws, Notices, Permits and Fees

.1 Add to the end of paragraph 10.2.4, the following words: "The Contractor shall notify the Chief Building Official or the registered code agency where applicable, of the readiness, substantial completion, and completion of the stages of construction set out in the Ontario Building Code. The Contractor shall be present

at each site inspection by an inspector or registered code agency as applicable under the Ontario Building Code."

.2 Delete paragraph 10.2.5 in its entirety.

.3 Add new paragraph 10.2.5 as follows: "The Contractor shall review the Contract Documents. If it should come to the attention of the Contractor that the Contract Documents are not in compliance with the applicable laws, ordinances, rules, regulations, or codes relating to the Work or if, subsequent to the date of bid closing, changes are made to the applicable laws, ordinances, rules, regulations or codes which require modifications to the Contract Documents or changes to the Contract Documents are required for any other reason by the authorities having jurisdiction, the Contractor shall notify the Consultant and the Owner in writing requesting direction immediately upon such non-compliance, modification or change becoming known to the Contractor. The Consultant will make changes to the Contract Documents in accordance with GC 6.1 - OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVES."

.38 GC 11.1 Insurance

.1 Delete paragraph 11.1.1.1 in its entirety.

.2 Add new paragraph 11.1.1.1 as follows: “General liability insurance shall be a stand alone policy in the name of the Contractor and include the Owner and the Consultant as additional insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the Contractor with regard to the Work. General liability insurance shall be maintained from the date of Commencement of the Work until one year from the date of Substantial Performance of the Work. Liability coverage shall be provided for completed operations hazards from the date of Substantial Performance of the Work, as set out in the certificate of Substantial Performance of the Work, on an ongoing basis for a period of 6 years following Substantial Performance of the Work.”

.3 Add the following as new last sentence of 11.1.1.5 (1): “The Boiler and Machinery insurance to include commissioning and testing of equipment and systems.”

.39 GC 12.1 Indemnification

.1 Add “and the Consultant” after the words “hold harmless the other” in paragraph 12.1.1.

.40 GC 12.3 Warranty

.1 Delete from the first line of paragraph 12.3.2 the word, “The” and substitute the words: "Subject to paragraph 3.14.1, the…"

.2 In paragraph 12.3.4, delete the words "promptly" in the first line and substitute the words "within ten (10) Working Days after notice from either the Consultant or the Owner."

.3 Add the following to the end of the paragraph 12.3.4: "If the Contractor fails to correct such defects of deficiency within such time frame, the Owner may correct in accordance with GC 7.1.4."

.4 Add new paragraph 12.3.7 as follows: "The University requires the contractor to obtain and maintain a Warranty Bond in the amount of 3% of contract value. This amount shall be released to the contractor after successful completion and confirmation of all outstanding warranty issues."

.41 Add new "GC 12.4 Contractor's Warranties" as follows:

.1 “12.4.1 Contractor hereby represents and warrants to Owner that Contractor:

.1 is a company experienced and skilled in the construction of the Work; and

.2 has by careful examination satisfied itself as to:

.1 the nature, location and character of the Place of the Work including the surface condition of the land and all structures and obstructions thereon, both natural and man made and all surface conditions of the Place of the Work;

.2 the nature, location and character of the general area in which the Place of the Work is located, including, without limitation, its climatic conditions, available labour supply and labour cost and available equipment supply and equipment cost;

.3 the quality and quantity of all materials, supplies, tools, labour and professional services necessary to complete the Work in the manner required by the Contract Documents;

.4 all other matters, or things which, in the reasonable judgment of Contractor, could in any apparent manner materially, affect the performance of the Work; and

.5 has all licenses necessary and required to perform the Work and is licensed in the Province applicable to the Place of the Work and the municipality in which the Project is located.

.42 Add new "**GC 12.5 Construction Liens"** as follows:

.1 "12.5.1 Contractor shall keep the Place of Work free and clear of all mechanics' liens or other liens for all Work performed under this Contract, unless such lien was the result of unjustified or unwarranted underpayment or nonpayment by Owner. If any such lien shall at any time be filed, Contractor shall cause same to be discharged of record within ten (10) days after notice of the filing of same, either by payment, deposit or surety bond pursuant to the applicable lien legislation of the province in which the Place of Work is located. If Contractor should fail so to discharge any such lien and such failure shall continue for a period of 10 days after notice to Contractor, then, in addition to any other remedy, Owner may, but shall not be obligated to, procure the discharge of same by depositing with the Court or by bonding the lien in accordance with the applicable lien legislation of the province in which the Place of Work is located. Any amount paid or deposited herewith by Owner and all expenses of Owner, including Owner's reasonable lawyers' fees and costs, and all necessary disbursement in connection therewith together with interest at the highest rate of interest lawfully chargeable under the applicable lien legislation of the province in which the Place of Work is located from the date of the payment of the deposit shall become due and payable forthwith and Owner may deduct same from the amounts and owing Contractor on account of the Contract Price. Notwithstanding the foregoing and in addition in all cases of nonpayment by Contractor, Owner is authorized, at Contractor's expense, to make such payments and offset the same against any amounts owing to Contractor under the Contract and/or any other contract, Subcontract or agreement to Contractor. If at any time there shall be any lien or claim for which Owner might become liable and which is chargeable to Contractor or any party claiming through Contractor, Owner shall have the right to retain out of any payment due or to become due by Owner to Contractor (under the Contract or any other agreement between Owner and Contractor), an amount sufficient to completely indemnify the Owner against such lien or Claim and shall have the right, at Contractor's expense, to discharge such lien by bonding and/or paying the claimant. The provisions of this paragraph shall require Owner to determine the accuracy of or adjust any claims or disputes between Contractor and Contractor's labourers, mechanics or materialmen, or withhold any money for their protection and the Owner shall not be liable for making any payments on Contractor's behalf. Contractor shall comply with all provisions of the applicable lien legislation of the province in which the Place of Work is located."

OWNER:	**CONTRACTOR**:
_____	_____
Per:_____	Per:_____
Name:_____	Name:_____
Title:_____	Title:_____
	Per:_____
	Name:_____
	Title:_____

END OF SUPPLEMENTARY CONDITIONS.

SCHEDULE "A"

LANGUAGE FOR OWNER PERSONNEL OR FOR THIRD PARTY CONTRACTORS ENTERING A PROJECT SITE WHERE THE CONTRACTOR HAS ASSUMED OVERALL RESPONSIBILITY - IN CONTRACT - FOR OCCUPATIONAL HEALTH AND SAFETY

"The (trade or employee) _____ acknowledges that the work it will perform on behalf of the Owner requires it to enter a job site which is under the total control of a Contractor which has a Contract with_____. The (trade or employee) _____ acknowledges that [name of Contractor] _____ has assumed overall responsibility for compliance with all aspects of the health and safety legislation of Ontario, including all the responsibilities of the "constructor" under the Occupational Health and Safety Act (Ontario). Further, (trade or employee) _____acknowledges that [name of Contractor] _____ is also responsible to co-ordinate and schedule the activities of our work with the Work of the Contractor.

We agree to comply with [name of Contractor] _____directions and instructions with respect to occupational health and safety and coordination. We acknowledge that it will be cause for termination under our contract with the Owner should (I/we) fail or refuse to accept the direction and

instruction of the Contractor with respect to matters of occupational health and safety or matters related to coordination of work.

We agree to have the Contractor named as an additional insured on our comprehensive liability policy."

CONTRACTOR:	**GENERAL CONTRACTOR:**
_____	_____
Per:_____	Per:_____
Name:_____	Name:_____
Title:_____	Title:_____

END OF DOCUMENT

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Title and description of Work.

.2 Existing services.

.3 Contract method.

.4 Contractor use of premises.

.5 Ownership of Materials

.6 Owner furnished items.

1.3 RELATED SECTIONS

.1 Section 06 10 10 - Rough Carpentry

1.4 WORK COVERED BY CONTRACT DOCUMENTS

.1 This is a reconfiguration for an approximately 3000 square foot area with-in the 5th floor Chancellor Paterson Library Building at Lakehead University in Thunder Bay, Ontario. Spaces will include office additions and open office reconfiguration.

.2 Architectural:
- .1 Work to include demolition and renovation within existing office space including new paint, new flooring, new ceilings, new lighting, new office partitions, new furniture and general touch-up as indicated.
- .2 Remove and replace tiles and grid as required to install under slab services from Fourth Floor level. Make good all surfaces and firestop penetrations to suit 2 hour fire separation. Clean space to Owners satisfaction. Replace any damaged tile or grid.

.3 Mechanical:
- .1 The existing staff lounge sink is to be removed.
- .2 A new staff lounge will have a single compartment sink. The existing plumbing services will be relocated to new area. This will be a 38Ø sanitary drain and vent and a 12Ø hot and cold water line.
- .3 New staff lounge faucet to be a single lever; chrome in colour; 1.5 gpm flow rate
- .4 Existing perimeter hydronic wall fin radiation to remain.
- .5 Provide one supply air diffuser complete with branch ductwork and balance damper for the new closed in office areas. Each office will have an egg crate type return air grille.
- .6 Provide one new return air grille c/w acoustically lined transfer air elbow for each of the three meeting / conference rooms.
- .7 Adjust existing supply air diffuser locations throughout area.
- .8 New storage room will have a dedicated exhaust and transfer air grille. Exhaust is to terminate up through roof. **Only required if the storage room is to hold chemical products.

.9 All supply air diffusers are to be square cone type; white in colour.
.10 The new conference room will receive ventilation, heat / cooling from an existing heat pump dedicated to the room complete with thermostat control located in the room.
.11 Existing hose cabinets to remain.
.12 Controls are to be Johnson Metasys only.
.13 All existing heat pumps are to be controlled by the existing temperature sensors.
.14 An existing temperature sensor will be relocated from the heat pump it serves to just outside a grouping of two offices located in the large open area. Approximately four relocated temperature sensors in total.
.15 Storage room exhaust to operate 24/7. (if needed)

.4 Electrical:
.1 New LED lighting throughout the renovation areas.
.2 Lighting control will be through standard toggle switches (no occupancy sensors).
.3 New/Relocated Power to facilitate new workstations, lounge, printers, etc.
.4 Relocate existing fire alarm devices to suit new layout.
.5 New Emergency Lighting within Open Office Area, Lobby, Conference Room and Corridors.
.6 New Exit Signage within renovation area to meet OBC requirements.
.7 Data raceways and cabling for workstations, offices, conference room and classroom.
.8 1x flush mount electrical/data floor-box for conference room.
.9 Electrical distribution shouldn't really be affected other than adding new breakers/circuits into existing panels where needed.

.5 Work by Others or Owner's Own Forces
.1 For the Owner's Own Forces and for other contractors, the General Contractor is to assume overall responsibility for compliance with all aspects of the applicable health and safety legislation and be responsible for the coordination of Work by Other Forces and other Contractors as part of the base bid contract. Refer to Section 00 80 00 - Supplementary Conditions.
.1 Work by Other's to include:
.1 Data and Telephone systems, (final terminations only).
.2 Owner's Security System, (conduit installed by Contract).
.3 LU TSC staff will come on site at the beginning of the rough-in stage to confirm locations of plywood panels for IT equipment mounting and electrical and data drops.
.4 Owners custodial and maintenance staff are to be allowed access as required to areas within the project site.

1.5 DAILY REPORTS/DAILY LOGS

.1 The Contractor to prepare a daily log or diary reporting on weather conditions, work force of the Contractor, Subcontractors, Suppliers and any other forces on site and also record the general nature of Project activities. Such log or diary shall also include any extraordinary or emergency events which may occur and also the identities of any persons who visit the site who are not part of the day-to-day work force.

.2 The Contractor shall also maintain records at the job site, recording manpower and material resources on the Project, including records which document the activities of the Contractor in connection with GC 3.5, and comparing that resources to the resources anticipated when the most recent version of the schedule was prepared pursuant to GC 3.5."

1.6 EXISTING SERVICES

.1 Notify, Consultant, Owner and utility companies of intended interruption of site services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Consultant and Owner 48 hours notice for necessary interruption of site services throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian vehicular traffic and tenant operations.

.3 Provide alternative routes for personnel, pedestrian and vehicular traffic.

.4 Establish location and extent of service lines in area of work before starting Work. Notify Consultant and Owner of findings.

.5 Submit schedule to and obtain approval from Consultant and owner for any shut-down or closure of active service or facility including power and communications services which may affect adjacent buildings. Adhere to approved schedule and provide notice to affected parties.

.6 Provide temporary services to maintain critical building and tenant systems.

.7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.8 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.

.9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.10 Record locations of maintained, re-routed and abandoned service lines.

.11 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures. Refer also to Drawings.

1.7 CONTRACT METHOD

.1 Construct Work under CCDC2 2008, Stipulated Price Contract.

1.8 CONTRACTOR USE OF PREMISES

.1 Contractor has unrestricted use of project site as defined until Substantial Performance.

.2 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.3 Emergency Building Exits During Construction: Means of egress shall be maintained throughout the construction period in accordance with applicable codes and regulations.

.4 Do not load or permit any part of the structure to be loaded with a weight that will endanger its safety. Questions of structural loading as part of construction means and methods shall be addressed by a licensed structural engineer engaged by Contractor, subject to the review by Consultant.

1.9 OWNERSHIP OF MATERIALS

.1 Unless otherwise specified, all materials existing at the Place of the Work at the time of execution of the Contract shall remain the property of the Owner. All work and Products delivered to the Place of the Work by the Contractor shall be the property of the Owner.

The Contractor shall remove all surplus or rejected materials as its property when notified in writing to do so by the Consultant.

1.10 OWNER FURNISHED ITEMS

.1 Owner Responsibilities:
- .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
- .2 Deliver supplier's bill of materials to Contractor.
- .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
- .4 Inspect deliveries jointly with Contractor.
- .5 Submit claims for transportation damage.
- .6 Arrange for replacement of damaged, defective or missing items.
- .7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.

.2 Contractor Responsibilities:
- .1 Designate submittals and delivery date for each product in progress schedule.
- .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of any observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
- .3 Receive and unload products at site.
- .4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
- .5 Handle products at site, including uncrating and storage.
- .6 Protect products from damage, and from exposure to elements.
- .7 Assemble, install, connect, adjust, and finish products.
- .8 Provide installation inspections required by public authorities.
- .9 Repair or replace items damaged by Contractor or subcontractor on site (under his control).

.3 Schedule of Owner furnished items.
- .1 Projection whiteboards, short throw projectors and projector brackets.
  - .1 GC to install projection whiteboard and required solid wood backing within wall cavity in accordance with Section 06 10 10 - Rough Carpentry and as indicated.
  - .2 LU to provide specification sheets c/w mounting heights; GC to review locations/heights with TSC prior to installation of all projection whiteboards.
  - .3 Owner will install short throw projector and installation bracket.

1.11 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 List of Outstanding Shop Drawings.
- .6 Change Orders.
- .7 Other Modifications to Contract.
- .8 Field Test Reports.
- .9 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 WORK RESTRICTIONS

.1 The workdays for the Project are defined as 7:00 am-8:00 pm, Monday through Friday. The schedule may require the Contractor to perform work other than the normal workday and in addition to the normal workday to meet milestones in the schedule for the Project, or to make up time previously lost to regain the progress schedule requirements or to prevent interruption of the Owner's ongoing operations at no additional cost to the Owner.

.2 Work that could potentially produce loud noise (trenching, core drilling, etc) can occur during regular hours **only** when classes and exams are not in session. At all other times, work producing excessive noise must occur after 4:30 pm or on weekends.

.3 Limit material delivery during peak traffic hours of 7:00am to 09:00am and 15:30pm to 17:00pm

1.3 SPECIAL REQUIREMENTS

.1 Submit schedule in accordance with Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart.

.2 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.3 Keep within limits of work and avenues of ingress and egress.

.4 Ingress and egress of Contractor vehicles at site is limited to two points to be determined at preconstruction stage.

1.4 PERMIT PROCEDURES

.1 Permit Procedures at Lakehead University for Hot Work and Access to Keys
- .1 Hot Works: Contractor to secure permits daily from Main campus as necessary. This may involve pick up and/or drop-off of permits to Main Campus regardless of location of subject work.
- .2 Key Access: Contractor to access keys daily from Main campus as necessary. This may involve pick up and/or drop-off of keys to Main Campus regardless of location of subject work.

1.5 EMPLOYEE RESTRICTIONS

.1 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract.

.2 The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

.3 Personal protection equipment for use by Contractor's employees shall be furnished by Contractor.

.4 Contractor shall take all necessary precautions to keep the Place of the Work free of safety hazards and shall comply with all applicable provisions of law and building codes relating to injury to persons and property on or about the Place of the Work where the Work is being performed.

.5 Contractor shall not permit any of its employees, agents, representatives, or its Subcontractors, or their employees, agents or representatives to interact with staff or students except those staff designated by Lakehead University.

.6 Contractor shall not permit any of its employees, agents, representatives, or its Subcontractors, or their employees, agents or representatives, to engage in any activity in, on, or about the Place of the Work, or in connection with the Work, that violates any ordinance, statute, or other regulation of any governmental body having jurisdiction over the Place of the Work, including, but not limited to, gambling and other activity, though lawful, which in the Owner's opinion is not proper construction practice.

.7 Contractor shall prevent all agents, employees, licensees, and invitees of Contractor from smoking on the Place of the Work.

.8 Contractor agrees that the possession, distribution, or sale of alcohol, narcotics, drug-related paraphernalia, firearms, explosives, weapons or other dangerous or hazardous substances or articles is strictly forbidden on or at the Place of the Work and at the Project (including the misuse of prescription drugs or any mood altering substance while performing any work at the Project or related thereto.)

.9 If at any time it is determined that any employee, representative, contractor or agent of Contractor is violating the drug and alcohol prohibition set forth herein, Owner shall be entitled, at its election, to terminate the Agreement upon Notice in Writing to Contractor.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Cash allowances.

.2 Contingency Allowance

1.3 RELATED SECTIONS

.1 Section 03 30 50 - Cast-in-Place Concrete.

.2 Section 08 71 10 - Door Hardware - General

1.4 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
- .1 CCDC 2-2008, Stipulated Price Contract.

.2 Project Supplementary Conditions

1.5 CASH ALLOWANCES

.1 Refer to CCDC 2, GC 4.1.

.2 Include in Contract Price, cash allowances stated herein.

.3 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing Work.

.4 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.

.5 Contract Price will be adjusted by written order to provide for an excess or deficit to each cash allowance.

.6 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in Contract Documents.

.7 Progress payments on accounts of work authorized under cash allowances shall be included in Consultant's monthly certificate for payment and will be made in accordance with Terms of Payment.

.8 Material cash allowances shall include payment for:
- .1 Net cost of material.
- .2 Applicable duties and taxes.
- .3 Delivery to site.
- .4 Handling at site, including unloading, uncrating, storage and hoisting.
- .5 Protection from damage by elements or otherwise.

.6 Labour for installation and finishing, and other expenses required to complete installation unless otherwise indicated in other sections.

.9 Amount of each allowance, for Work specified in respective specification Sections is as follows:

.1 **Hardware Allowance:**

.1 **$9,500.00** for supply only of door hardware, FOB Jobsite. Preparation of doors and installation of doors and hardware to be included in the Base Bid Price in accordance with Section 06 10 10 - Rough Carpentry.

1.6 CONTINGENCY ALLOWANCE

.1 Refer to CCDC 2, GC 4.2, Contingency Allowance.

.2 Include in Contract Price a **Contingency Allowance of $25,000.00.**

.3 Do not include in Contract Price, additional contingency allowances for products, installation, overhead or profit.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Product Installation Alternatives to work.

.2 Incorporation of accepted Alternatives into Agreement.

1.3 RELATED SECTIONS

.1 Section 00 41 10 - Stipulated Price Bid Form

1.4 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
  .1 CCDC 23-2003, A Guide to Calling Bids and Awarding Contracts.

1.5 REQUIREMENTS

.1 Referenced specification Sections stipulate pertinent requirements for products and methods to achieve the Work stipulated under each Alternate Pricing Method.

.2 Coordinate affected related Work and modify surrounding Work to integrate the Work under each Alternative.

1.6 AWARD/SELECTION OF ALTERNATIVES

.1 Unsolicited General Contractor Alternatives are prices that have been provided by the Contractor without invitation or submittal and approval prior to the close of tender. Unsolicited General Contractor Alternatives **will not** be used to determine the lowest Bid Price.

.2 Itemized Prices are prices that have been provided by the Contractor to identify the costs associated with a scope of Work listed in this Section. The cost of the Itemized Price is to be included in the Bid Price.

.3 Indicate variation of Bid Price for Alternatives described below and list in Bid Form. Note that this form requests a 'difference' in Bid Price by adding to or deducting from the Bid Price.

.4 Indicate the cost to increase the Bid Price for Separate Prices described below and list in Bid Form. Note that this form requests the price to increase the Bid Price. The Separate Price is not to be included in the Bid Price.

.5 In accordance with CCDC Document No. 23 - A Guide to Calling Bids and Awarding Contracts, low Bid shall be determined on basis of lowest Bid in accordance with Contract Documents on which Project is to be actually constructed, including those approved Alternatives and Separate Prices for which prices have been invited and which are to be incorporated in the Work.

1.7 ALTERNATIVES

.1 Alternative No. 1.

1.8 ITEMIZED PRICES

.1 Itemized Price No.1.

1.9 SEPARATE PRICE

.1 Separate Price No. 1.

1.10 UNIT PRICES

.1 Unit Price No. 1.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Consultant are specified under various sections.

1.3 APPOINTMENT AND PAYMENT

.1 Consultant will appoint the testing agency and payment will be made under Section 01 21 00 - Allowances for services of testing laboratory except as 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 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
- .4 Mill tests and certificates of compliance.
- .5 Tests specified to be carried out by Contractor under the supervision of Consultant.

.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 Consultant to verify acceptability of corrected work.

1.4 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:
- .1 Provide access to Work for inspection and testing.
- .2 Facilitate inspections and tests.
- .3 Make good Work disturbed by inspection and test.
- .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Consultant sufficiently to allow for assignment of Testing Agency. Co ordinate scheduling of tests 24 hours in advance of operations with agency and Consultant.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Consultant.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Coordination between mechanical and electrical work, and work of other affected Sections.

1.3 SUBMITTALS

.1 Submit name, address, and telephone number of person responsible for Mechanical and Electrical Coordination to Consultant.

.2 Submit coordination drawings and schedules prior to shop drawings, product data and samples.

1.4 COORDINATION

.1 Coordinate work of Mechanical and Electrical Contractors with other work.

.2 Coordinate Progress Schedules, including dates for submittals and for delivery of products.

.3 Conduct conferences among subcontractors, and other concerned entities as necessary to establish and maintain coordination and schedules, to identify conflicts between work of Mechanical and Electrical trades and other work, and to resolve matters in dispute.

.4 In progress meetings, report on progress of work to be adjusted under coordination requirements, and any needed changes in schedules.

.5 Transmit minutes of meetings to concerned entities.

1.5 COORDINATION DOCUMENTS

.1 Prepare coordination drawings of installation for efficient use of available space, for proper sequence of installation, and to resolve conflicts. Work on drawings to include but not limited to:
- .1 Electrical conduit, cables and cable trays,
- .2 Plumbing heating, cooling, supply and return piping, drainage piping (account for couplings joints),
- .3 Fire suppression piping (account for coupling joints),
- .4 HVAC ductwork (account for transitions and changes in direction, boots and diffusers),
- .5 Architectural framing and finishes

.2 Maintain documents throughout construction period, recording changes due to modifications and adjustments.

.3 After acceptance of original and revised documents, reproduce and distribute copies to each concerned entity.

1.6 COORDINATION REQUIREMENTS

.1 Review shop drawings, product data, and samples for compliance with Contract Documents and for coordination with work of other sections of the project manual.

.2 Check field dimensions and clearances, relation to available spaces, and anchor bolt settings.

.3 Check compatibility with equipment and work of other sections, electrical characteristics, and control requirements.

.4 Check motor voltages and control characteristics.

.5 Coordinate controls and interlocks, voltages, and wiring of pneumatic switches, and relays.

.6 Coordinate wiring and control diagrams.

.7 Review effect of any changes on work of other sections.

.8 Verify and coordinate maintenance of Record Documents.

1.7 COORDINATION OF SUBSTITUTIONS AND MODIFICATIONS

.1 Review proposals and requests from subcontractors. Check for compliance with Contract Documents and for compatibility with work and equipment of other sections.

.2 Submit to Architect with recommendation for action.

1.8 EQUIPMENT STARTUP

.1 Verify utilities, connections, and controls are complete and equipment is in operable condition.

.2 Observe startup and adjustments; record time and date of startup, and results.

.3 Observe equipment demonstrations to Owner; record times and record additional information required in Operation and Maintenance Manuals.

1.9 INSPECTION AND ACCEPTANCE OF EQUIPMENT

.1 Prior to inspection, verify that equipment is tested and operational, clean, and in specified condition.

1.10 PATCH AND REPAIR

.1 Co ordinate work of tie in of mechanical and electrical work to suit design.

.2 Co ordinate work specified in other sections and as indicated, inside and outside the work area identified on contract documents with all subtrades for cutting, removal, patch and repair and clean-up of existing building components such as but not limited to gypsum board and masonry walls and removal and replacement of ceiling tiles and grid.

PART 2 Products

2.1 NOT USED

.1 Not Used.

PART 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 ADMINISTRATIVE

.1 Provide physical space and make arrangements for meetings.

.2 Meeting space to have adequate seating, heat and light.

1.3 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities. Consultants, Owner, Contractor, major Subcontractors, field inspectors and supervisors to be in attendance.

.2 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.3 Agenda to include:

- .1 Appointment of official representative of participants in the Work.
- .2 Schedule of Work: in accordance with Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart.
- .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
- .5 Delivery schedule of specified equipment.
- .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .8 Owner provided products.
- .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .12 Monthly progress claims, administrative procedures, photographs, hold backs.
- .13 Appointment of inspection and testing agencies or firms.
- .14 Insurances, transcript of policies.

1.4 PROGRESS MEETINGS

.1 During course of Work and two weeks prior to project completion, schedule progress meetings every two weeks. Meeting schedule may be adjusted depending on progress of the Work.

.2 Contractor, major Subcontractors involved in Work, Consultants and Owner are to be in attendance.

.3 Consultant will record minutes of meetings and circulate within five days after meeting. Distribution will be to Contractor, Consultants, Owner and Authorities. Contractor to distribute to sub-contractors and suppliers as they deem necessary.

.4 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

.5 Agenda to include the 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.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

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

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

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

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

.5 Critical Activity: any activity on a critical path. Most commonly determined by using critical path method.

.6 Critical Path: series of activities that determines duration of Project. In deterministic model, critical path is usually defined as those activities with float less than or equal to specified value, often zero. It is longest path through Project.

.7 Critical Path Method (CPM): network analysis technique used to predict Project duration by analyzing which sequence of activities (which path) has least amount of scheduling flexibility (least amount of float).

.8 Duration: number of work periods (not including holidays or other non-working periods) required to complete activity or other project element. Usually expressed as workdays or work weeks.

.9 Master Plan: summary-level schedule that identifies Critical Path of construction activities and key milestones.

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

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

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

1.3 REQUIREMENTS

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

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

.3 Limit activity durations to maximum of approximately 5 working days, to allow for progress reporting.

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

1.4 SUBMITTALS

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

.2 Submit to Consultant within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Consultant within 5 working days of receipt of acceptance of Master Plan.

1.5 MASTER PLAN

.1 Structure Master Plan to allow orderly planning, organizing and execution of Work as Critical Path Schedule.

.2 Consultant will review and return revised Master Plan within 5 working days.

.3 Revise Master Plan and resubmit within 5 working days.

.4 Accepted Master Plan will be used as baseline for updates and determination of delay and other claims.

.5 If the Contractor does not provide an acceptable Master Plan future claims for Delay or extension of the contract will not be considered.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule as a Bar Chart (GANTT) Schedule derived from the Master Plan.

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

- .1 Award.
- .2 Shop Drawings, Samples (submittal date and return date).
- .3 Permits.
- .4 Mobilization.
- .5 Site services and site grading
- .6 Excavation.
- .7 Backfill.
- .8 Concrete forming, reinforcing and pouring
- .9 Structural Steel installation.
- .10 Rough Carpentry
- .11 Interior partitions

.12 Architectural woodwork
.13 Components of exterior building envelope.
.14 Interior wall, flooring and ceiling finishing.
.15 Installation of Specialty items
.16 Plumbing.
.17 Lighting.
.18 Electrical.
.19 Piping.
.20 Controls.
.21 Heating, Ventilating, and Air Conditioning.
.22 Millwork.
.23 Fire Systems.
.24 Testing and Commissioning.
.25 Landscaping
.26 Exterior concrete walks and gutters
.27 Gravel pavement
.28 Supplied equipment, long delivery items.
.29 Owner supplied equipment required dates.

1.7 PROJECT SCHEDULE REPORTING

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

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

1.8 PROJECT MEETINGS

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

.2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

2.1 NOT USED

.1 Not used

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 ADMINISTRATIVE

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

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

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

.4 General Contractors are to review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.

.5 Where, at the sole discretion of the Consultant, it is determined the submittal has not been satisfactorily reviewed by the General Contractor, the submittal will be returned to the General Contractor for review and correction.

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

.7 Verify field measurements and affected adjacent Work are co-ordinated.

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

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.

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

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 Refer to CCDC 2 GC 3.11.

.2 Access to Consultants Drawings:

.1 Contractors are responsible for the preparation of their own original shop drawings. The use of Consultants drawing either electronically or reproductions is prohibited without the consent of the Consultant. The General Contractor will be given access to the Consultants Share File web site. The General Contractor will be responsible for the retrieval and distribution of AutoCADD 2000 version files to the Sub Contractors or suppliers. Appended to this Section is the Sub-Contractor/Supplier Disclaimer, Waiver, Release and Indemnity form. This form is to be filled out, dated and signed by the subcontractor or supplier and submitted along with any Shop Drawing submittal that has used the Consultants drawings in their preparation.

.3 Submit required shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in the Province of Ontario, Canada.

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.5 Allow 10 days for Consultant's review of each submission.

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

.7 Accompany submissions with transmittal letter, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.
- .6 Use Consultant supplied Shop Drawing Transmittal form.

.8 Submissions include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.9 After Consultant's review, distribute copies.

.10 Submit one (1) pdf version of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
- .1 Consultant will review and stamp hard copy, create a .pdf of the document and return to the Contractor by e-mail. The Contractor will be responsible for printing copies as required for distribution to trades.
- .2 Shop Drawings in excess of 279 x 432 (11 X 17) are to be submitted in pdf and hardcopy. Submit 3 copies over required number of copies to be distributed by Contractor.

.11 Submit one (1) pdf version of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit one (1) pdf version of test reports for requirements requested in specification Sections and as requested by Consultant.
- .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
- .2 Testing must have been within 3 years of date of contract award for project.

.13 Submit one (1) pdf version of certificates for requirements requested in specification Sections and as requested by Consultant.
- .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 one (1) pdf version of manufacturers instructions for requirements requested in specification Sections and as requested by Consultant.
- .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit one (1) pdf version of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.
- .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.16 Delete information not applicable to project.

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

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

1.4 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 Consultant's business address.

.3 Notify Consultant 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 Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.6 Make changes in samples which Consultant 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 - Quality Control.

1.6 PROGRESS PHOTOGRAPHS

.1 Submit weekly progress photographs in electronic digital format.

.2 Photographs to be of a quality as to be discernable to the Consultant.

.3 Submit photographs of conflict areas to expedite resolution of problems.

1.7 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

FORM ARCHITECTURE ENGINEERING

BETTER PLACES FOR PEOPLE

SUBCONTRACTOR/SUPPLIER
DISCLAIMER, WAIVER, RELEASE AND INDEMNITY

Project Name: _____

Sub Contractor/Supplier: _____

Access to the AutoCadd 2000 version Drawings is being given by FORM Architecture Engineering to the signatory and in return for being allowed access to the Drawings, the signatory agrees to be bound by the following terms and conditions:

1. The Drawings are to be used as a guide only to reduce your time and work load in preparing Shop Drawing submittals.
2. The signatory releases FORM Architecture Engineering of any claims or liability whatsoever by reason of any errors or omissions in the Drawings.
3. The signatory is responsible to satisfy themself if the Drawings are accurate and appropriate for their purposes and cannot rely in any way on FORM Architecture Engineering or otherwise.
4. The signatory waives any right to rely on the accuracy of the Drawings, and agree that they are using the Drawings at their own risk and without any warranty or representation by FORM Architecture Engineering as to the accuracy or suitability of the Drawings for their purposes.
5. The signatory shall indemnify and save harmless FORM Architecture Engineering (including without limitation, its partners, officers, employees, agents, representatives and independent contractors) from any claims made by anyone by reason of their access to or use of the Drawings, and this indemnity shall include any costs, damages or claims whatsoever.
6. The signatory shall not use or copy the Drawings for any purpose other than preparing their Shop Drawings.
7. The signatory will not provide copies to nor allow anyone else access to the Drawings without the prior written consent of FORM Architecture Engineering.

I agree to the above terms and conditions.

Dated at _____, this _____ day of _____, 201_.

_____ _____

Signature Print Name

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

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

1.3 REFERENCES

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

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario
- .1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2005.

.4 Lakehead University
- .1 Health and Safety: Policies, Procedures, Guidelines and Standards.
- .2 Available on Lakehead University Website at: http://hr.lakeheadu.ca/wp/?pg

1.4 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
- .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit 1 copy of Contractor's authorized representative's work site health and safety inspection reports to Consultant weekly.

.4 Submit copies of reports or directions issued by Provincial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

.7 Consultant and Owner will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 5 days after receipt of comments from Consultant.

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

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

1.5 FILING OF NOTICE

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

1.6 SAFETY ASSESSMENT

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

1.7 MEETINGS

.1 Schedule and administer Health and Safety meeting with Consultant and Owner prior to commencement of Work.

1.8 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.9 GENERAL REQUIREMENTS

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

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

.3 If the site specific Health and Safety Plan is in conflict with the Owner's Health and Safety Plan, the Lakehead University Health and Safety: Policies, Procedures, Guidelines and Standards shall take precedence. Copies of Lakehead University Health and Safety Policies, Procedures, Guidelines and Standards are available through the Human Resources link on the LU web page at http://hr.lakeheadu.ca.

.4 A pre-job meeting shall be held with Contractor Management and Supervision to clarify and reinforce the company's accident prevention requirements.

.5 The Contractor will report to the Owner, Consultant and jurisdictional authorities, any accident or incident involving Contractor, employee, members of the Public; Personnel and/ or Property arising from the Contractor's execution of the work

.6 A Material Safety Data Sheet must accompany each shipment and goods must be labelled per WHMIS regulations, or goods will be returned at the supplier's expense.

.7 The contractor will be responsible to take all necessary steps to protect personnel (workers, visitors, general public etc.) and the property, from any harm during the course of the contract.

.8 Initial disregard for safety standards will cause the contract to be reviewed and a written record of the review will become part of the contract documents. A second infraction can lead to loss of contract.

.9 If the Contractor, their sub-contractors or suppliers are responsible for a delay in the progress of the work due to an infraction of legislation or the health and safety requirements, the Contractor, their sub-contractors or suppliers will, without any additional cost to the Owner, work such overtime, acquire and use for the execution as to be

necessary, in the opinion of the Consultant to avoid delay in the final completion of the work or any operations thereof.

.10 The Contractor shall:
- .1 Be diligent in ensuring that it's subcontracts comply with all health and safety and environmental legislation.
- .2 Take appropriate disciplinary action against sub-contractors who contravene health and safety or environmental legislation which includes but is not limited to the suspending of the work performed by the sub-contractors, where appropriate, before allowing them to continue work on the site; and
- .3 Be vigilant in following up on Ministry of Labour directives where safety violations are noted.

1.10 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site including other Contracts and Owner's Own Forces in accordance with Section 00 80 00 - Supplementary Conditions.

.2 Be responsible for 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.

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

1.11 COMPLIANCE REQUIREMENTS

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

1.12 UNFORSEEN HAZARDS

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

1.13 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
- .1 Have working knowledge of occupational safety and health regulations.
- .2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .4 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.14 POSTING OF DOCUMENTS

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

1.15 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction, Consultant or Owner.

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

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

1.16 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 References and Codes.

1.3 REFERENCES AND CODES

.1 Perform Work in accordance with 2006 Building Code (Ontario Regulation 350/06) including all amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 If the Contractor observes that contract documents are at variance with specified codes, notify Consultant in writing immediately. Consultant will process changes in accordance with General Conditions of the CCDC 2 2008 Contract.

.3 If the Contractor performs any work knowing or having reason to know that the work is contrary to such laws, rules and regulations and fails to so notify the Consultant, the Contractor shall pay all costs arising therefrom. However, it will not be the Contractor's primary responsibility to make certain that the contract documents are in accord with such laws, rules and regulations.

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

1.4 SUBMITTALS

.1 Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, notices, judgments, correspondence, records, and similar documents, bearing on requirements of this and other sections.

.2 Contractor’s Training Program Records: For Owner’s records, submit Contractor employee training records upon request of Owner.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
  .1 CCDC 2 2008, Stipulated Price Contract.

1.3 INSPECTION

.1 Refer to CCDC 2, GC 2.3.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be arranged by Consultant for purpose of inspecting and/or testing portions of Work.

.2 Allocated costs: to Section 01 21 00 - Allowances.

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

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

.5 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 Consultant at no cost to the Owner. 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 Consultant and agency 24 hours in advance of requirement for tests, in order that attendance arrangements can be made.

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

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

1.7 REJECTED WORK

.1 Refer to CCDC, GC 2.4.

1.8 REPORTS

.1 Submit 1 copy of inspection and test reports to Consultant.

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

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Consultant and may be authorized as recoverable.

1.10 MOCK-UPS

.1 Prepare mock-ups for Work indicated in Schedule of Room Mock-Ups and as indicated in other Sections.

.2 Construct in locations acceptable to Consultant.

.3 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be considered.

.5 If requested, Consultant will assist in preparing schedule fixing dates for preparation.

.6 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.11 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

1.12 EQUIPMENT AND SYSTEMS

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

.2 Refer to Section 01 79 00 - Demonstration and Training for definitive requirements.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel for transition period between removal of existing HVAC system and installation of new HVAC system.

.2 The Contractor may use the new HVAC if required, however, the system must be cleaned, ducts vacuumed, new filters provided, etc. to ensure no construction dust/debris remains upon turnover to Lakehead University.

.3 Heaters used in the vicinity of combustible tarpaulins, canvas, or similar coverings shall be located at least 3 metres from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other materials.

.4 Construction heaters used inside building must be vented to outside. Preference should be given to natural gas fired appliances. Solid fuel salamanders are not permitted.

.5 Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workmen. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.

.6 Flammable liquid-fired heaters shall be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed shall not be considered a primary safety control.

.7 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.

.8 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.

.9 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.

.10 Permanent heating system of building not to be used unless approved by agreement with the Consultant and the Project Manager.

.11 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.

.12 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.5 WATER SUPPLY

.1 Arrange with Lakehead University for connection to building water supply and pay costs for installation, maintenance and removal.

1.6 TEMPORARY POWER AND LIGHT

.1 Arrange with Lakehead University for connection to building electrical supply and pay costs for installation, maintenance and removal.

.2 Ensure level of illumination on all floors and stairs is not less than 162 lx.

.3 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that warranties and guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.7 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone and fax hook up, lines and equipment necessary for own use and use of Consultant and Project Manager.

.2 Provide and pay for computer equipment including a PC tower and minimum 17" monitor or a laptop with a minimum 17" screen for access to e-mail for digital transfer of photographs and information.

.3 Provide a Wi-Fi connection to the internet for access to R-Forms, the Consultants web based Contract Administration program for own use and use of Consultant and Project Manager.

1.8 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 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
- .1 CCDC 2 2008, Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.Canadian Standards Association (CSA International)
- .3 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .4 CSA-0121-M1978(R2003), Douglas Fir Plywood.
- .5 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
- .6 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

1.3 SUBMITTALS

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

1.4 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 Indicate use of supplemental or other staging area.

.3 Provide construction facilities in order to execute work expeditiously.

.4 Remove from site all such work after use.

1.5 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, temporary stairs and all other facilities for performing the Work.

1.6 HOISTING

.1 Provide, operate and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists to be operated by qualified operator.

1.7 SITE STORAGE/LOADING

.1 Refer to CCDC 2, GC 3.12.

.2 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.3 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.8 CONSTRUCTION PARKING AND LAYDOWN

.1 During the construction period, access for loading/unloading materials and equipment will be provided at or near one of the entrances to the building for these specific items. LU Security will also allow contractor parking free of charge in one of the designated parking lots as long as vehicles are clearly identified as being a contractor vehicle.

1.9 CONTRACTORS FIELD OFFICE

.1 The Contractor shall provide a temporary field office of suitable size for construction administrative operations and consultations with the Owner and Consultant and to accommodate site meetings and to be furnished with drawing laydown table and a computer, laptop or other suitable electronic device and printer for access to the rforms contract administration website. Space is not available within the existing building.

.2 The office to be heated to 22 degrees C, lighted to 750lx and well ventilated.

.3 The Contractor's field office shall contain a complete set of Contract Documents.

.4 Provide a clearly marked and fully stocked first-aid case in a readily available location.

.5 The temporary field office shall not be removed until the Contractor has completed all Substantial Completion Punch List items.

.6 The Contractor shall make arrangements and pay all costs associated with the temporary field office.

.7 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.10 CONSTRUCTION SIGNAGE

.1 Provide sign base and erect project sign within 2 weeks of receiving approved sign layout from Consultants. Sign base frame to be wood construction with 2.4m x 2.4m plywood back to accept vinyl sign face, sign face by Allowance.

.2 Provide and erect project sign, within two weeks of receiving approved sign layout.

.3 Construction sign to be 2 - 2.4m x 2.4m panels, of wood frame and plywood construction with vinyl sign face. Supply only of sign face vinyl graphics to Section 01 21 00 - Allowances install of sign face by this section.

.4 Indicate on sign, name of Owner, Project Manager, Consultants, Contractor and Funding Agents (if applicable), to design provided by Consultant.

.5 No other signs or advertisements, other than warning signs, are permitted on site.

.6 Locate project identification sign as directed by Consultant and construct as follows:
- .1 Build concrete foundation, erect framework, and attach signboard to framing.
- .2 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
- .3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.

.7 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.8 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Consultant.

1.11 SECURITY

.1 Contractor will be responsible for the security of the site.

.2 The existing building and its contents shall be kept secure at all times within the area of the Work. Provide temporary closures as required to maintain security as directed by the Owner and Consultant.

.3 Provide temporary construction as required to separate and protect occupied areas of the building from construction activities. Temporary construction shall comply with code requirements for building type and occupancy.

.4 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays as deemed necessary.

1.12 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in 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 manner to cause least interference with work activities.

1.13 SANITARY FACILITIES

.1 ROOM 1016 will be assigned to the Contractor.

.2 The Contractor must sign the washroom as "Construction Use Only".

.3 The Contractor to maintain, stock & clean the washrooms. LU will monitor this, if the Contractor does not 'maintain/stock/clean', LU will revoke the use, and the Contractor will provide their own facitlities at their own cost.

.4 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.14 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 not in construction facilities.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Fire Routes.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)
- .1 CGSB 1.189M-84, Primer, Alkyd, Wood, Exterior.
- .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)
- .1 CSA-O121-M1978, Douglas Fir Plywood.

1.4 GUARD RAILS AND BARRICADES

.1 Provide barricades to the approval of the Consultant and the University to prevent access by staff and students into the Work area.

.2 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells and open edges of floors and roofs.

.3 Provide as required by governing authorities.

1.5 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated partitions to localize dust generating activities from the remainder of the building, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

.3 Provide filtred protection to wall openings in ceiling spaces, existing ductwork and as required to prevent dust migration through the building air system.

.4 Coordinate dust screens with maintenance staff and relocate as required for operation of facility. Refer to Drawings for specific locations required in addition to what Contractor deems necessary.

.5 Provide dust tight screens and drop clothes as required and as directed by the Owner for Work on Fourth Floor when installing services under slab for renovation of Fifth Floor. Protect Fourth Floor equipment, and furniture from damage. Do work after hours or on weekends. Leave space in a condition satisfactory to the Owner at the beginning of each day.

1.6 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

.2 Maintain access for staff and students during construction.

1.7 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.

1.8 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

.2 maintain exit routes within the building for staff and students.

1.9 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.

.3 Provide dust control protection for adjacent buildings and equipment during performance of the Work.

.4 Provide necessary screens, covers, hoardings as required.

.5 Be responsible for damage due to lack of or inadequate protection.

1.10 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 Consultant locations and installation of protection devices.

.4 Be responsible for damage incurred due to lack of or improper protection.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

.4 Existing facilities.

1.3 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)
  .1 CCDC 2 2008, Stipulated Price Contract.

.2 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether any product or system is in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.4 QUALITY

.1 Refer to CCDC 2, GC 3.9.

.2 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.3 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.

.4 Should any dispute arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 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. 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.

.2 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, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

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

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber and like products on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Consultant.

.9 Touch-up damaged factory finished surfaces when acceptable to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.7 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by Owner will be paid for by Owner. Unload, handle and store such products.

1.8 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify 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.

1.9 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, 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.

1.10 CO-ORDINATION

.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.

1.11 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.

1.12 REMEDIAL WORK

.1 Refer to CCDC 2, GC 3.13 and Section 01 73 03 - Execution Requirements.

1.13 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.

1.14 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.

1.15 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.16 PROTECTION OF WORK IN PROGRESS

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

1.17 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 pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Requirements and limitations for cutting and patching the Work.

1.3 RELATED SECTIONS

.1 Individual product Sections: cutting and patching incidental to work of section. Advance notification to other sections required.

1.4 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 elements.
- .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 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.

1.5 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.6 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 may be exposed by uncovering work; maintain excavations free of water.

1.7 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, 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 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.10 Restore work with new products in accordance with requirements of Contract Documents.

.11 Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.

.13 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

.14 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.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

1.3 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)
  .1 CCDC 2 2008, Stipulated Price Contract.

1.4 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 Consultant. Do not burn waste materials on site.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only and remove from site as directed by Consultant.

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

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

.6 Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.7 Remove waste material and debris from site and deposit in waste container at end of each working day.

.8 Dispose of waste materials and debris off site at municipal landfill site.

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

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

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

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

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

1.5 FINAL CLEANING

.1 Refer to CCDC 2, GC 3.14.

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

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

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

.5 Remove waste products and debris other than that caused by Owner or other Contractors.

.6 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.

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

.8 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.

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

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

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

.12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer or as agreed by Owner.

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

.14 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds made dirty by this contract.

.15 Remove dirt and other disfiguration from exterior surfaces caused by this contract.

.16 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment used during construction.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.3 Inert Fill: inert waste - exclusively asphalt and concrete.

.4 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.5 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.6 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.7 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.8 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
- .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
- .2 Returning reusable items including pallets or unused products to vendors.

.9 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.10 Separate Condition: refers to waste sorted into individual types.

.11 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

.12 Waste Audit (WA): detailed inventory of waste materials. Involves quantifying by volume/weight amounts of materials and wastes generated during construction. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.

.13 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.14 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

1.3 DOCUMENTS

.1 Maintain at job site, one copy of following documents:
- .1 Waste Audit.
- .2 Waste Reduction Workplan.
- .3 Material Source Separation Plan.
- .4 Schedules A, B and E completed for project.

1.4 SUBMITTALS

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

.2 Prepare and submit following prior to project start-up:
- .1 Submit 2 copies of completed Waste Audit (WA): Schedule A.
- .2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
- .3 Submit 2 copies of Materials Source Separation Program (MSSP) description.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal.
- .1 Failure to submit could result in hold back of final payment.
- .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
- .3 For each material reused, sold or recycled from project, include amount in tonnes, quantities by number, type and size of items and the destination.
- .4 For each material land filled or incinerated from project, include amount in tonnes, of material and identity of landfill, incinerator or transfer station.

1.5 WASTE AUDIT (WA)

.1 Prepare WA: Schedule A.

.2 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.6 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not limited to:
- .1 Destination of materials listed.
- .2 Location.
- .3 Clear labelling of storage areas.
- .4 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.7 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Consultant.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

1.8 WASTE RECYCLING SITES

.1 Eclipse Recycling.
- .1 Telephone: (807) 622-3164

.2 ReCool Canada Inc.
- .1 Telephone: (807) 577-0411

.3 Enviro West Inc.
- .1 Telephone: (807) 393-1717

1.9 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, or paint thinner into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:
- .1 Number and size of bins.
- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.

1.10 SCHEDULING

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 APPLICATION

.1 Do Work in compliance with WRW.

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

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Consultant, and consistent with applicable fire regulations.
- .1 Mark containers or stockpile areas.
- .2 Provide instruction on disposal practices.

.2 On-site sale of reusable, recyclable materials is not permitted.

.3 Construction Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	___
Plastic Packaging	100	___
Rubble	100	___
Steel	100	___
Wood (uncontaminated)	100	___
Other		___

3.4 WASTE AUDIT (WA)

.1 Schedule A - Waste Audit (WA):

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood and Plastics Material Description						
Off-cuts						
Warped Pallet Forms						
Plastic Packaging						
Cardboard Packaging						
Other						

3.5 WASTE REDUCTION WORKPLAN (WRW)

.1 Schedule B:

(1) Material Category	(2) Person(s) Respon-sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material Destina-tion
Wood and Plastics Material Description							
Chutes							
Warped Pallet Forms							
Plastic Packaging							
Card-board Packaging							
Other							

3.6 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Schedule E - Government Chief Responsibility for the Environment:

Province	Address	General Inquires	Fax
Ontario	Ministry of Environment and Energy, 135 St. Clair Avenue West Toronto ON M4V 1P5	416-323-4321 800-565-4923	416-323-4682
	Environment Canada Toronto ON	416-734-4494	

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Administrative procedures preceding preliminary and final inspections of Work.

1.3 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
  .1 CCDC 2 2008, Stipulated Price Contract.

1.4 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Prior to request by the Contractor for Substantial Completion review, Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects and repair as required to conform to Contract Documents.
  .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  .2 Request Consultant's Inspection.

.2 Consultant's Inspection: Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:
  .1 Work has been completed and inspected for compliance with Contract Documents.
  .2 Defects have been corrected and deficiencies have been completed.
  .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
  .4 Certificates required by Boiler Inspection Branch and Utility companies have been submitted.
  .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 Owner, Consultant, and Contractor. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request reinspection.

.5 Declaration of Substantial Performance: when Owner and Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article GC5.4 and Section 00 88 00 - Supplementary Conditions for specifics to application.

.6 Commencement of Lien and Warranty Periods: date of advertisement in the Commercial Daily News shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment: When Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request reinspection.

.8 Payment of Holdback: After issuance of certificate of Substantial Performance of Work and after the end of the lien period, submit an application for payment of holdback amount in accordance with CCDC 2.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 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.

.7 Final site survey.

1.3 SUBMISSION

.1 Prepare Maintenance Manuals and As-Built Drawings using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with Consultant's comments.

.3 Revise content of documents as required prior to final submittal.

.4 Two weeks prior to Substantial Performance of the Work and prior to Demonstration and Training, submit to the Consultant, three final copies and an electronic CD version of operating and maintenance manuals in English and As-Built Drawings.

.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.

1.4 FORMAT

.1 Organize data in the form of an instructional Maintenance Manual.

.2 Binders: 3 Total - vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets. Include Electronic version on CD/ DVD with each binder copy.

.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.

1.5 CONTENTS - EACH VOLUME

.1 Hard Copy Binder plus One (1) CD/DVD containing the entire contents of the binder

.2 Table of Contents: provide title of project;
- .1 date of submission; names,
- .2 addresses, and telephone numbers of Consultants, Contractor and Sub-Contractors with name of responsible parties;
- .3 schedule of products and systems, indexed to content of volume.

.3 For each product or system:
- .1 list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.4 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.5 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.6 Shop Drawings: Include in Maintenance Manuals one (1) copy of all approved shop drawings.

.7 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 - Quality Control.

.8 Training: Refer to Section 01 79 00 - Demonstration and Training.

1.6 PROJECT DOCUMENTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for Consultant and Owner review, one copy of project documents as follows:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to the Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.2 Store project documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label project documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document **"PROJECT DOCUMENT"** in neat, large, printed letters.

.4 Maintain project documents in clean, dry and legible condition. Do not use project documents for construction purposes.

.5 Keep project documents and samples available for inspection by 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 Consultant. Mark these documents **AS-BUILT DRAWINGS**.

.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 Addenda and change orders.

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

.7 Fire Separation Labelling:
- .1 Fire Resistance Rating to be marked on all fire separations, both sides, max distance between labels to be 1220mm.
- .2 Fire Resistance Rating to be applied by stencil using red paint with capital letters, minimum 25mm high
  - .1 Nomenclature to be used as appropriate:
    - .1 0 HOUR
    - .2 45 MIN
    - .3 60 MIN
    - .4 90 MIN
- .3 Fire Seals and Fire Resistance Rating to be indicated and listed on a spreadsheet including wall construction, UL/ULC systems used and fire resistance rating.
- .4 Spreadsheet to be submitted with As-Built Drawings.
- .5 Consultant will provide the spreadsheet to the Contractor for this purpose.

.8 Fire Damper Locates:
- .1 Consultant drawings indicate the general location of fire dampers. Contractor to provide confirmation of location and accessibility to ensure Owner’s ability to inspect.
- .2 The Consultant and the Contractor shall conduct a special building tour to demonstrate the location of each damper to the Physical Plant.
- .3 Contractor to indicate on the HVAC As-Built Drawings the actual location and type and size of dampers installed.

1.8 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

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

.3 Include installed colour coded wiring diagrams.

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

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

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

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

.8 Include sequence of operation by controls manufacturer.

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

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

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

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

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

1.9 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.

1.10 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 and location as directed; place and store.

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

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

1.11 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 and location as directed; place and store.

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

.5 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 and location as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing toConsultant. 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 Consultant.

1.14 WARRANTIES AND BONDS

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

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

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

.6 Co-execute submittals when required.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Demonstrate operation and maintenance of equipment and systems to Owner's personnel two weeks prior to date of Substantial Completion.

.2 Owner to provide a list of personnel to receive instructions, and co-ordinate their attendance at agreed-upon times.

.3 Preparation:
- .1 Verify conditions for demonstration and instructions comply with requirements of the Contract Documents.
- .2 Verify designated personnel are present.
- .3 Ensure equipment has been inspected and put into operation in accordance with appropriate Section.
- .4 Ensure testing, adjusting, and balancing has been performed and equipment and systems are fully operational.

.4 Demonstration and Instructions:
- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at the equipment location.
- .2 Instruct personnel in phases of operation and maintenance, using operation and maintenance manuals as basis of instruction.
- .3 Review contents of manual in detail to explain aspects of operation and maintenance.
- .4 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.

.5 Time Allocated for Instructions: ensure amount of time required for instruction of each item of equipment or system as follows:
- .1 Heating Plant: 8 hours of instruction.
- .2 Cooling and Ventilation System: 8 hours of instruction.
- .3 Control System: 4 hours of instruction.
- .4 Plumbing System: 4 hours of instruction.
- .5 Electrical System: 8 hours of instruction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Consultant's and Owner's approval.

.3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.4 Give time and date of each demonstration, with list of persons present.

.5 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.4 QUALITY ASSURANCE

.1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:
  .1 Instruct Owner's personnel.
  .2 Provide written report that demonstration and instructions have been completed.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Methods and procedures for demolition of existing concrete sidewalks and patios, parts of structures and foundation walls.

1.3 RELATED SECTIONS

.1 Section 02 81 01 - Hazardous Materials
.2 Section 31 23 10 - Excavation, Trenching and Backfilling.

1.4 REFERENCES

.1 Canadian Standards Association (CSA International)
  .1 CSA S350-M1980(R1998), Code of Practice for Safety in Demolition of Structures.
.2 Department of Justice Canada (Jus).
  .1 Canadian Environmental Assessment Act (CEAA), 1992, c. 37.
  .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
    .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
  .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.5 DEFINITIONS

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.
.2 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.
.3 Salvage: Removal of disassembled building materials for the purpose of reuse or recycling.
.4 Demolish: Remove and legally dispose of off-site.

1.6 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
.2 Prior to beginning of Work on site submit detailed Waste Diversion List in accordance with Section 01 74 21 - Construction/Demolition Waste Management and indicate:
  .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused and recycled.
  .2 Schedule of Selective Demolition Activities: Indicate the following:
    .1 Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
    .2 Interruption of utility services. Indicate how long utility services will be interrupted.
    .3 Coordination for shutoff, capping, and continuation of utility services.
    .4 Use of elevator and stairs.
    .5 Locations of proposed dust- and noise-control temporary partitions and means of egress.
    .6 Means of protection for items to remain and items in path of material removal from building.
  .3 Number and location of dumpsters.
  .4 Anticipated frequency of tippage.
  .5 Name and address of haulers, waste facilities and waste receiving organizations.

.3 Submit copies of certified weigh bills, bills of lading, receipts from authorized disposal sites and reuse and recycling facilities for material removed from site on a monthly basis.
.1 Written authorization from Consultant is required to deviate from haulers facilities receiving organizations listed in Waste Reduction Workplan.
.4 Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.
.5 Describe selective demolition methodology, sequencing, and materials handling and removal procedures. Include the anticipated final destination of each material.
.6 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Ontario, Canada.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial and Municipal regulations.
.2 Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
.3 Comply with noise and dust regulations of authorities having jurisdiction.
.4 Pre-Selective demolition Conference: Conduct conference at Project site. Review methods and procedures related to selective demolition including, but not limited to, the following:
.1 Inspect and discuss condition of building to be selectively demolitioned.
.2 Review structural load limitations of existing structure.
.3 Review and finalize selective demolition schedule and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
.4 Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
.5 Review areas where existing construction is to remain and requires protection.
.6 Review method for removing materials from the site.
.7 Review staging area for materials on the site.

1.8 HEALTH AND SAFETY

.1 Do all demolition work in accordance with CSA S350-M1980 latest revision, Code of Practice for Safety in Demolition of Structures and Section 01 35 30 - Health And Safety Requirements.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management.
.2 Divert excess materials from landfill to site approved by Consultant.

1.10 ENVIRONMENTAL PROTECTION

.1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures, Section 01 74 21 - Construction/Demolition Waste Management and Section 01 56 00 - Temporary Barriers and Enclosures
.2 Ensure Work follows the requirements for Infection and Dust Control as outlined in Section 01 56 00 - Temporary Barriers and Enclosures.
.3 Ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
.4 Fires and burning of waste or materials is not permitted on site.
.5 Do not bury rubbish waste materials.
.6 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
.1 Ensure proper disposal procedures are maintained throughout project.
.7 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

.8 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction and as directed by Consultant.
.9 Protect trees, plants and foliage on site and adjacent properties where indicated.
.10 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
.11 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.11 EXISTING CONDITIONS

.1 Should material resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of demolition, stop work, take preventative measures, and notify Consultant immediately. Do not proceed until written instructions have been received.
.2 Structures to be demolished to be based on their condition on date that tender is accepted.
.3 Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
.4 Maintain fire-protection facilities in service during demolition operations.

Part 2 Products

2.1 EQUIPMENT

.1 Equipment and heavy machinery to:
  .1 On-road vehicles to meet applicable emission requirements as prescribed in CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
  .2 Off-road vehicles to meet applicable emission requirements as prescribed in EPA CFR 86.098-10 and EPA CFR 86.098-11.
.2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PROTECTION

.1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades and parts of existing building to remain.
.2 Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain and/or to prevent unexpected or uncontrolled movement or collapse of construction being selectively demolitioned.
.3 Strengthen or add new supports when required during progress of selective demolition.
.4 Support affected structures and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify Consultant.
.5 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.

3.2 PREPARATION

.1 Do Work in accordance with Section 01 35 30 - Health and Safety Requirements.
.2 Disconnect and re-route electrical and telephone service lines entering buildings to be demolished.
  .1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.
.3 Disconnect and cap designated mechanical services.
  .1 Natural gas supply lines: remove in accordance with gas company requirements.
  .2 Sewer and water lines: in accordance with authority having jurisdiction and as directed by Consultant.
  .3 Other underground services: remove and dispose of as indicated.

.4 Do not disrupt active or energized utilities traversing premises designated to remain undisturbed.
.5 Remove rodent and vermin as required by Consultant.

3.3 SAFETY CODE

.1 Do demolition work in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
.2 Blasting operations not permitted during demolition.

3.4 REMOVAL OF HAZARDOUS WASTES

.1 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.
.2 Prior to start of demolition work remove contaminated or hazardous materials listed as hazardous and as directed by Consultant from site and dispose of at designated disposal facilities in safe manner and in accordance with TDGA and other applicable requirements and Section 02 81 01 - Hazardous Materials. Refer to Existing Conditions in Part 1.

3.5 STOCKPILING

.1 Label stockpiles, indicating material type and quantity.
.2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
.3 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.
.4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.
.5 Supply separate, clearly marked disposal bins for categories of waste material. Do not remove bins from site until inspected and approved by Consultant please notify Consultant prior to removal of bins from site.

3.6 REMOVAL FROM SITE

.1 General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.
.2 Do not allow demolished materials to accumulate on-site.
.3 Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
.4 Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
.5 Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
.6 Burning: Do not burn demolished materials.

3.7 CLEANING

.1 Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED REQUIREMENTS

.1 Section 02 81 01 - Hazardous Materials

.2 Section 07 92 00 - Joint Sealant.

.3 Section 09 91 10 - Painting.

1.3 REFERENCES

.1 Definitions:
- .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.2 Reference Standards:
- .1 Canadian Environmental Protection Act,1999 (CEPA 1999)
  - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
- .2 Department of Justice Canada (Jus)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
  - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
- .3 Green Seal Environmental Standards (GS)
  - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
  - .2 GS-36-00, Commercial Adhesives.
- .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 National Research Council Canada Institute for Research in Construction (NRC-IRC)
  - .1 National Fire Code of Canada-2005.

.3 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, Adhesive and Sealant Applications.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literatureand data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 30 - Health and Safety Requirements 01 35 43 - Environmental Procedures to Consultant for each hazardous material required prior to bringing hazardous material on site.
.3 Submit hazardous materials management plan to Consultant that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

.3 Low-Emitting Materials: submit listing of adhesives and sealants and paints and coatings used in building, comply with VOC and chemical component limits or restrictions requirements.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.

.4 Storage and Handling Requirements:
.1 Abide by internal requirements for labelling and storage of materials and wastes.
.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the local authority having jurisdiction.
.5 Transfer of flammable and combustible liquids is prohibited within buildings.
.6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
.7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
.9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
.10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
.1 Store hazardous materials and wastes in closed and sealed containers.
.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.
.4 Segregate incompatible materials and wastes.
.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
.6 Store hazardous materials and wastes in secure storage area with controlled access.
.7 Maintain clear egress from storage area.
.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
.10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
.11 When hazardous waste is generated on site:
.1 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
.2 Use licensed carrier authorized by provincial authorities to accept subject material.
.3 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
.4 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
.5 Only trained personnel handle, offer for transport, or transport dangerous goods.
.6 Provide photocopy of shipping documents and waste manifests to Consultant upon request.
.7 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Consultant upon request.
.8 Report discharge, emission, or escape of hazardous materials immediately to Consultant and appropriate provincial authority. Take reasonable measures to control release.
.12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
.13 Report spills or accidents immediately to Consultant. Submit a written spill report to Consultant within 24 hours of incident.

.5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in accordance with Section 01 74 21 - Construction Waste Management.

Part 2 Products

2.1 MATERIALS

.1 Description:
.1 Bring on site only quantities hazardous material required to perform Work.
.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
.3 Sustainability Characteristics:
.1 Adhesives and Sealants in accordance with Section 07 92 00 - Joint Sealant.
.1 Adhesives and Sealants: maximum VOC limit to SCAQMD Rule 1168 and to GS-36.
.2 Primers Paints Coatings in accordance with manufacturer's recommendations for surface conditions and Section 09 91 10 - Painting.

.1 Primer: maximum VOC limit 250 g/L to GS-11 to SCAQMD Rule 1113.
.2 Paints: maximum VOC limit 50 g/L to GS-11 to SCAQMD Rule 1113.

Part 3 Execution

3.1 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Waste Management.
  .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
  .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
  .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
  .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
  .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
  .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
  .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
  .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
    .1 Hazardous wastes recycled in manner constituting disposal.
    .2 Hazardous waste burned for energy recovery.
    .3 Lead-acid battery recycling.
    .4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Work on this project may involve disturbance of non-friable asbestos-containing materials (ACM) as identified in Section 1.8 below.

.2 Comply with requirements of this Section when performing following work:

.1 Installing or removing non-friable ACM if the material is installed or removed without being broken, cut, drilled, abraded, sanded or vibrated.

.2 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable ACM, except for plaster, if,

.1 the material is wetted to control the spread of dust or fibres, and

.2 the work is done only by means of non-powered hand-held tools.

.3 Removing less than 1 m^2 of drywall which has AC mud joint compound (MJC) as long as the work is done using non-powered hand-held tools.

1.2 SECTION INCLUDES

.1 Requirements and procedures for asbestos abatement of non-friable ACM (i.e. Type 1 Asbestos Operations).

1.3 REFERENCES

.1 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.2 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.3 Ontario Ministry of Labour (MOL).

.1 Occupational Health and Safety Act (OHSA).

.1 Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations.

.4 Ontario Ministry of the Environment and Climate Change (MOECC).

.1 Environmental Protection Act (EPA).

.1 Ontario Regulation 347/90 – General – Waste Management.

1.4 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.2 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials identified under Existing Conditions including fallen materials and settled dust.

.4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.

.5 Authorized Visitors: Engineer, Consultants or designated representatives, and representatives of regulatory agencies.

.6 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.7 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.

.8 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

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

1.5 SUBMITTALS

.1 Submit proof satisfactory to Consultant that asbestos removal methods will satisfy requirements for Type 1 procedures.

.1 If, in the opinion of the Consultant, the Contractor's proposed work methods do not meet the intent of this section, carry out work in accordance with Asbestos Abatement – Type 2 or Type 3 Operations.

.2 The onus is on the Contractor to select the appropriate removal method to satisfy regulatory requirements and these specifications.

.2 Submit proof satisfactory to Consultant that employees have had instruction on hazards of asbestos exposure, respirator use, dress, entry and exit from Asbestos Work Area, and aspects of work procedures and protective measures.

.1 Training to meet or exceed requirements of O. Reg. 278/05.

.3 Submit proof that supervisory personnel have attended asbestos abatement course approved by Consultant. Minimum of one supervisor for every ten workers.

.1 Training to meet or exceed requirements of O. Reg. 278/05.

.4 Submit proof satisfactory to Consultant that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.5 Submit Provincial and/or local requirements for Notice of Project Form.

.6 Submit proof of Contractor's Asbestos Liability Insurance.

.7 Submit to Consultant necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.

.2 Health and Safety:

.1 Safety Requirements: worker protection.

.1 Protective equipment and clothing are not required for Type 1 asbestos operations; however, if a worker requests respiratory protection, the following is to be supplied by Contractor and worn by workers while in the Asbestos Work Area:

.1 Non-powered reusable or replaceable filter-type respirator equipped with HEPA filter cartridges, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.3 In the event of discrepancy between these specifications and Table 2 of O. Reg. 278/05, the requirements of Table 2 will apply.

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

.3 Before leaving Asbestos Work Area, dispose of protective clothing as contaminated waste as specified.

.4 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are located as close to Asbestos Work Area as possible.

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

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate paper, plastic, polystyrene, and corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

.3 Separate for recycling and place in designated containers Steel, Metal and Plastic waste in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.6 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

.7 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.8 EXISTING CONDITIONS

.1 Information pertaining to confirmed and potential ACMs to be handled, removed or otherwise disturbed and disposed of in the renovation area has been provided.

.2 Notify Consultant of ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Consultant.

.3 Asbestos is present in the following building materials as summarized in the pre-renovation designated substance information provided by CBRE and attached to these specifications:

.1 Non-friable mud joint compound (MJC) associated with finished drywall walls in the renovation area (LU Room numbers 5003 and 5005) contains 0.5-5 % chrysotile asbestos.

.2 Figures, tables and reports pertaining to ACM to be handled, removed, or otherwise disturbed and disposed of during this project are provided for general information only and are not necessarily representative of all ACM covered within the scope of this project. Contractors are to satisfy themselves as to the exact quantity and location of ACM for disturbance or removal as part of the current project PRIOR TO BID CLOSE.

1.9 SCHEDULING

.1 Contractor is responsible for scheduling of asbestos abatement work in order to achieve the desired renovation schedule.

.2 Inform sub-trades of presence of friable asbestos-containing materials identified in Existing Conditions.

.3 Co-ordinate with Consultant, Owner, Owner's representatives and other contractors when scheduling work.

1.10 OWNER'S INSTRUCTIONS

.1 Before beginning Work, provide Consultant satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, following minimum requirements:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by a competent, qualified person.

Part 2 Products

2.1 MATERIALS

.1 Drop Sheets:

.1 Polyethylene: 0.15 mm thick.

.2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.

.3 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable polyethylene waste bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.

Part 3 Execution

3.1 PROCEDURES

.1 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.

.1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.

.2 Use HEPA vacuum, or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.

.3 Do not use compressed air to clean up or remove dust from any surface.

.2 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.

.1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained.

.3 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.

.1 Use garden reservoir type low - velocity fine - mist sprayer.

.2 Perform Work to reduce dust creation to lowest levels practicable.

.3 Work will be subject to visual inspection and air monitoring.

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

.5 All wetting shall be conducted with amended water.

.4 Clean-Up:

.1 Frequently during Work and immediately after completion of Work, clean up dust and asbestos-containing waste using HEPA vacuum or by damp mopping.

.2 Place dust and asbestos-containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, then place in plastic bags.

.3 Drop sheets shall not be reused.

.4 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.

.5 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.

.6 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

.7 Reusable barriers shall be cleaned by HEPA vacuuming and damp wiping.

3.2 INSPECTIONS

.1 The following visual inspections will be completed by the Consultant over the duration of the work. The Contractor is to provide minimum 24 hours notice to the Consultant to arrange for the inspections. Asbestos Abatement Work shall not proceed until each inspection is completed and approval to proceed is obtained from the Consultant.

.1 Initial Inspection: following completion of preparation of work area but prior to the commencement of ACM removal.

.2 Clearance Inspection: following completion of all removal work and cleaning and sealing of all surfaces within the enclosure, but prior to removing hoarding, drop sheets or other containment barriers.

.2 If results of the visual inspection suggest that asbestos remains in the work area, re-clean in accordance with section 3.1 and any additional direction provided by the Consultant. Re-cleaning shall be at no additional cost to the Client.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Work on this project may involve disturbance of non-friable asbestos-containing materials (ACM) as identified in 1.8 below.

.2 Comply with requirements of this Section when performing following Work:

.1 Removing 1 m^2 or more of drywall which has associated ACM MJC as long as the work is done using non-powered hand-held tools.

.2 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable ACM, including drywall with AC MJC, if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.

1.2 SECTION INCLUDES

.1 Requirements and procedures for asbestos abatement of intermediate amounts of ACM of the type described within (i.e. Type 2 Asbestos Operation).

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.205-2003, Sealer for Application of Asbestos-Fibre Releasing Materials.

.2 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA).

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

.1 Material Safety Data Sheets (MSDS).

.4 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.5 Underwriters' Laboratories of Canada (ULC).

.6 Ontario Ministry of Labour (MOL).

.1 Occupational Health and Safety Act (OHSA).

.1 Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in buildings and Repair Operations.

.7 Ontario Ministry of the Environment and Climate Change (MOECC).

.1 Environmental Protection Act (EPA).

.1 Ontario Regulation 347/90 – General – Waste Management.

1.4 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.

.2 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials identified under Existing Conditions Article, including fallen materials and settled dust.

.4 Minor Amounts of ACMs: less than or equal to 1 m^2 of friable material containing asbestos.

.5 Asbestos Work Area: area where work takes place which will, or may disturb ACMs.

.6 Authorized Visitors: Engineer, or designated representatives, and representatives of regulatory agencies.

.7 Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

.8 Occupied Area: any area of building or work site that is outside Asbestos Work Area.

.9 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

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

1.5 SUBMITTALS

.1 Submit proof satisfactory to Consultant that asbestos removal methods will satisfy requirements for Type 2 procedures.

.1 If, in the opinion of the Consultant, the Contractor's proposed work methods do not meet the intent of this section, carry out work in accordance with Asbestos Abatement – Type 3 Operations.

.2 The onus is on the Contractor to select the appropriate removal method to satisfy regulatory requirements and these specifications.

.2 Submit proof satisfactory to Consultant that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to Consultant necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 Submit proof satisfactory to Consultant that employees have had instruction on hazards of asbestos exposure, respirator use, dress, entry and exit from Asbestos Work Area, and aspects of work procedures and protective measures.

.1 Training to meet or exceed requirements of O. Reg. 278/05.

.7 Submit proof that supervisory personnel have attended asbestos abatement course approved by Consultant. Minimum of one supervisor for every ten workers.

.1 Training to meet or exceed requirements of O. Reg. 278/05.

.8 Submit Worker's Compensation Board status and transcription of insurance.

.9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:

.1 amended water; and

.2 slow-drying sealer.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.

.2 Health and Safety:

.1 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Non-powered reusable or replaceable filter-type respirator equipped with HEPA filter cartridges, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.3 Where conflict between these specifications and Table 2 of O. Reg. 278/05, the requirements of Table 2 will apply.

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

.3 Before leaving Asbestos Work Area, dispose of protective clothing as contaminated waste as specified.

.4 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing shall be located as close as possible to the Asbestos Work Area.

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

.2 Visitor Protection:

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

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

.4 Separate for reuse and recycling and place in designated containers Steel, Metal and Plastic waste in accordance with Waste Management Plan.

.5 Place materials defined as hazardous or toxic in designated containers.

.6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

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

.8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial/Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

.9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.8 EXISTING CONDITIONS

.1 Information pertaining to confirmed and potential ACMs to be handled, removed or otherwise disturbed and disposed of in the renovation area has been provided.

.2 Notify Consultant of ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Consultant.

.3 Asbestos is present in the following building materials as summarized in the pre-renovation designated substance information provided by CBRE and attached to these specifications:

.1 Non-friable mud joint compound (MJC) associated with finished drywall walls in the renovation area (LU Room numbers 5003 and 5005) contains 0.5-5 % chrysotile asbestos.

.4 Figures, tables and reports pertaining to ACM to be handled, removed, or otherwise disturbed and disposed of during this project are provided for general information only and are not necessarily representative of all ACM covered within the scope of this project. Contractors are to satisfy themselves as to the exact quantity and location of ACM for disturbance or removal as part of the current project PRIOR TO BID CLOSE.

1.9 SCHEDULING

.1 Contractor is responsible for scheduling of asbestos abatement work in order to achieve the desired renovation schedule.

.2 Inform sub-trades of presence of friable asbestos-containing materials identified in Existing Conditions.

.3 Co-ordinate with Consultant, Owner, Owner's representatives and other contractors when scheduling work.

1.10 OWNER'S INSTRUCTIONS

.1 Before beginning Work, provide Consultant satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, in use of glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at minimum:

.1 Fitting of equipment.
.2 Inspection and maintenance of equipment.
.3 Disinfecting of equipment.
.4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

Part 2 Products

2.1 MATERIALS

.1 Drop and Enclosure Sheets.

.1 Polyethylene: 0.15 mm thick.

.2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos-containing material.

.3 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable polyethylene bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.

.4 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

.5 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.

.1 Sealer: flame spread and smoke developed rating less than 50.

Part 3 Execution

3.1 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

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

3.2 PROCEDURES

.1 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.

.2 Before beginning Work remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.

.1 Use HEPA vacuum, or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.

.2 Do not use compressed air to clean up or remove dust from any surface.

.3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.

.1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.

.2 Cover or remove from the work area any equipment or furniture inside of it.

.3 Cover wall surfaces with one layer of 6 mil polyethylene sheeting sealed with tape.

.4 Disable the mechanical ventilation system serving the work area.

.5 Seal the ventilation ducts to and from the work area.

.4 Thoroughly wet friable material containing asbestos to be removed or disturbed before and during Work unless wetting creates hazard or causes damage.

.1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.

.5 Perform Work in a manner to reduce dust creation to lowest levels practicable.

.6 Work is subject to visual inspection. Consultant reserves the right to complete air monitoring on a random basis. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas at no cost to the owner.

.7 Clean-up:

.1 Frequently during Work and immediately after completion of work, clean up dust and asbestos-containing waste using HEPA vacuum or by damp mopping.

.2 Place dust and asbestos-containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.

.3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.

.4 Seal and remove double-bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.

.5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

.8 Re-establish mechanical and electrical systems in proper working order. Install new filters.

3.3 INSPECTIONS

.1 The following visual inspections will be completed by the Consultant over the duration of the work. The Contractor is to provide minimum 24 hours notice to the Consultant to arrange for the inspections. Asbestos Abatement Work shall not

proceed until each inspection is completed and approval to proceed is obtained from the Consultant.

.1 Initial Inspection: following completion of preparation of work area but prior to the commencement of ACM removal.

.2 Clearance Inspection: following completion of all removal work and cleaning and sealing of all surfaces within the enclosure, but prior to removing hoarding, drop sheets or other containment barriers.

.2 If results of the visual inspection suggest that asbestos remains in the work area, re-clean in accordance with Section 3.2 and any additional direction provided by the Consultant. Re-cleaning shall be at no additional cost to the Client.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Work on this project may involve disturbance of non-friable asbestos-containing materials (ACM) as identified in 1.8 below.

.2 Comply with the requirements of this Section when performing the following Work:

.1 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable ACM, including drywall with ACM MJC, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filter.

1.2 SECTION INCLUDES

.1 Requirements and procedures for asbestos abatement of major amounts of ACM of the type described within (i.e. Type 3 Asbestos Operations).

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.205-2003, Sealer for Application to Asbestos-Fibre-Releasing Materials.

.2 Canadian Standards Association (CSA International).

.3 Department of Justice Canada.

.1 Canadian Environmental Protection Act (CEPA), 1999.

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

.1 Material Safety Data Sheets (MSDS).

.5 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.6 Underwriters' Laboratories of Canada (ULC).

.7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention (CDC)/National Institute for Occupational Safety and Health (NIOSH).

.1 NIOSH 94-113-August 1994, NIOSH Manual of Analytical Methods (NMAM), 4th Edition.

.8 Ontario Ministry of Labour (MOL).

.1 Occupational Health and Safety Act (OHSA).

.1 Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations.

.9 Ontario Ministry of the Environment and Climate Change (MOECC).

.1 Environmental Protection Act (EPA).

.1 Ontario Regulation 347/90 – General – Waste Management.

1.4 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.2 Amended Water: water with a non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials identified under Existing Conditions Article, including fallen materials and settled dust.

.4 Asbestos Work Area: Area where actual removal of asbestos-containing materials takes place.

.5 Authorized Visitors: Engineer, Consultants or designated representatives, and representatives of regulatory agencies.

.6 Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

.7 Occupied Area: any area of building or work site that is outside Asbestos Work Area.

.8 Polyethylene sheeting sealed with tape: Polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through sheeting into clean area.

.9 DOP Test: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.

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

.11 Negative pressure: system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.

.1 System to maintain minimum pressure differential of 0.02 inches of water relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.

.12 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.

.13 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:

.1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.

.2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.

.3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.

1.5 SUBMITTALS

.1 Before beginning work:

.1 Obtain from appropriate agency and submit to Consultant necessary permits for transportation and disposal of asbestos waste. Ensure that dump operator is fully aware of hazardous nature of material being dumped, and proper methods of disposal. Submit proof satisfactory to Consultant that suitable arrangements have been made to receive and properly dispose of asbestos waste.

.2 Provide to the Consultant satisfactory proof that every worker has had instruction and training in the hazards of asbestos exposure, in personal hygiene including dress and showers, in entry and exit from the Asbestos Work Area, in all aspects of work procedures including glove bag procedures, and in the use, cleaning, and disposal of respirators and protective clothing. Training must meet the requirements of O. Reg. 278/05 made under the Occupational Health and Safety Act. Submit proof of training in the form of certificates for all workers (W253) and supervisors (S253).

.3 Submit documentation including test results for sealer proposed for use.

.4 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.

.5 Submit proof of Contractor's Asbestos Liability Insurance.

.6 Submit proof satisfactory to Consultant that employees have respirator fitting and testing. Workers must be fit-tested (irritant smoke test) with respirator that is personally issued.

.7 Submit Worker's Compensation Board status and transcription of insurance.

.8 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including but not limited to following:

.1 amended water; and

.2 slow-drying sealer.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among those

requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Health and Safety:

.1 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing to be worn by workers while in the Asbestos Work Area includes:

.1 Respirator equipped with HEPA filter cartridges or supplied-air type, personally issued to worker and marked as to efficiency and purpose, and acceptable to Authority having jurisdiction as suitable for type of asbestos and level of asbestos exposure in Asbestos Work Area (i.e. if the material is wetted then a full facepiece negative or powered air purifying respirator with HEPA cartridges, if not wetted then supplied air). If disposable type filters are used, provide sufficient filters so that workers can install new filters following disposal of used filters and before re-entering contaminated areas.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.3 In the event of discrepancy between specifications and Table 2 of O. Reg. 278/05, the requirements of O. Reg. 278/05 apply.

.2 Requirements for each worker:

.1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean coveralls and head covers before entering Equipment and Access Rooms or Asbestos Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.

.2 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room and remove clothing except respirators. Place contaminated worksuits in receptacles for disposal with other asbestos - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. Workers shall have facilities to wash face and hands. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

.3 After washing face and hands, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.

.4 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter work area.

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

.4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.

.5 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

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

.7 Visitor Protection:

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

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Separate for recycling and place in designated containers Steel, Metal and Plastic waste in accordance with Waste Management Plan.

.5 Place materials defined as hazardous or toxic in designated containers.

.6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

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

.8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

.9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.8 EXISTING CONDITIONS

.1 Information pertaining to confirmed and potential ACMs to be handled, removed or otherwise disturbed and disposed of in the renovation area has been provided.

.2 Notify Consultant of ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Consultant.

.3 Asbestos is present in the following building materials as summarized in the pre-renovation designated substance information provided by CBRE and attached to these specifications:

.1 Non-friable mud joint compound (MJC) associated with finished drywall walls in the renovation area (LU Room numbers 5003 and 5005) contains 0.5-5 % chrysotile asbestos.

.4 Figures, tables and reports pertaining to ACM to be handled, removed, or otherwise disturbed and disposed of during this project are provided for general information only and are not necessarily representative of all ACM covered within the scope of this project. Contractors are to satisfy themselves as to the exact quantity and location of ACM for disturbance or removal as part of the current project PRIOR TO BID CLOSE.

1.9 SCHEDULING

.1 Not later than ten (10) days before beginning Work on this Project notify following in writing:

.1 Ontario Ministry of Labour.

.2 Disposal Authority.

.2 Inform sub-trades of presence of friable asbestos-containing materials identified in Existing Conditions.

.3 Submit to Consultant copy of notifications prior to start of Work.

.4 Contractor is responsible for scheduling of asbestos abatement work in order to achieve the desired renovation schedule.

.5 Co-ordinate with Consultant, Owner, Owner’s representatives and other contractors when scheduling work.

1.10 OWNER'S INSTRUCTIONS

.1 Before beginning Work, provide to Consultant satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene including dress and showers, in entry and exit from Asbestos Work Area, in aspects of

work procedures including glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at minimum:

.1 Proper fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

.4 Supervisory personnel to complete required training.

Part 2 Products

2.1 MATERIALS

.1 Polyethylene: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.

.2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.

.3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

.4 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Consultant, mixed with water in concentration to provide adequate penetration and wetting of asbestos-containing material.

.5 Asbestos waste containers: Metal or fibre - type acceptable to dump operator with tightly fitting covers and 0.15 mm minimum thickness sealable polyethylene liners.

.1 Label containers in accordance with requirements of O.Reg. 278/05 and O.Reg. 347/90. Label in both official languages.

.6 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.

Part 3 Execution

3.1 PREPARATION

.1 Work Areas:

.1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to

ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.

.2 Pre-clean moveable furniture within proposed work areas using HEPA vacuum and remove from work areas to temporary location as specified by Owner.

.3 Pre-clean fixed casework, plant, and equipment within proposed work areas using HEPA vacuum and cover with polyethylene sheeting sealed with tape.

.4 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.

.5 Unless the work will be done outdoors or in a building that will be demolished, put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. Provide continuous monitoring of pressure difference using automatic recording instrument.

.6 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape and/or other means as described for the project (e.g. erection of a semi-permanent partition wall).

.7 Cover wall surfaces with one layer of 6 mil polyethylene sheeting sealed with tape.

.8 Build airlocks at entrances to and exits from work areas so that work areas are always closed off by one curtained doorway when workers enter or exit.

.9 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)".

.10 After work area isolation, remove heating, ventilating, and air conditioning filters, pack in sealed plastic bags 0.15 mm minimum thick and treat as contaminated asbestos waste. Remove ceiling - mounted objects such as lights, partitions, other fixtures not previously sealed off, and other objects that interfere with asbestos removal, as directed by Consultant or Owner. Use localized water spraying during fixture removal to reduce fibre dispersal.

.11 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Ontario Fire Marshall or other authority having jurisdiction.

.12 Where application of water is required for wetting asbestos-containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

.2 Worker Decontamination Enclosure System:

.1 Worker Decontamination Enclosure System includes Equipment and Access Room, Wash up area, and Clean Room, as follows:

.1 Equipment and Access Room: build Equipment and Access Room between Wash up area and work areas, with two curtained doorways, one to Shower Room and one to work areas. Install waste receptor, and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.

.2 Wash up area: Provide a means for workers to wash face and hands.

.3 Clean Room: build Clean Room between Shower Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.3 Container and Equipment Decontamination Enclosure System:

.1 Container and Equipment Decontamination Enclosure System consists of Staging Area within work area, Washroom, Holding Room, and Unloading Room. Purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which Worker Decontamination Enclosure System is not suitable.

.1 Staging Area: designate Staging Area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to Washroom. Equip Staging Area with curtained doorway to Washroom.

.2 Washroom: build Washroom between Staging Area and Holding Room with two curtained doorways, one to Staging Area and one to Holding Room. Provide high - pressure low - volume sprays for washing of waste containers and equipment. Pump waste water through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.

.3 Holding Room: build Holding Room between Washroom and Unloading Room, with two curtained doorways, one to Washroom and one to Unloading Room. Build Holding Room sized to accommodate at least two waste containers and largest item of equipment used.

.4 Unloading Room: build Unloading Room between Holding Room and outside, with two curtained doorways, one to Holding Room and one to outside.

.4 Construction of Decontamination Enclosures:

.1 Build suitable framing for enclosures or use existing rooms where convenient, and line with polyethylene sheeting sealed with tape. Use one layer of FR polyethylene on floors.

.2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.5 Separation of Work Areas from Occupied Areas:

.1 Separate parts of building required to remain in use from parts of building used for asbestos abatement by means of airtight barrier system constructed as follows:

.1 Build suitable floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting sealed with tape, and apply 9 mm minimum thick plywood. Seal joints between plywood sheets and between plywood and adjacent materials with surface film forming type sealer, to create airtight barrier.

.2 Cover plywood barrier with polyethylene sealed with tape, as specified for work areas.

.6 Maintenance of Enclosures:

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Visually inspect enclosures at beginning of each working period.

.4 Use smoke methods to test effectiveness of barriers when directed by Consultant.

.7 Do not begin Asbestos Abatement work until:

.1 Arrangements have been made for disposal of waste.

.2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.

.3 Work areas and decontamination enclosures and parts of building required to remain in use are effectively segregated.

.4 Tools, equipment, and materials waste containers are on hand.

.5 Arrangements have been made for building security.

.6 Warning signs are displayed where access to contaminated areas is possible.

.7 Notifications have been completed and other preparatory steps have been taken.

3.2 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

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

3.3 ASBESTOS REMOVAL

.1 Before removing asbestos:

.1 Prepare site.

.2 If it is safe to do so, spray ACM with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent

release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.

.2 Remove asbestos material in small sections. Do not allow asbestos materials to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure that containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of stripping work, wire brushed and wet-sponged surfaces from which asbestos has been removed to remove visible material. During this work keep surfaces wet.

.5 After wire brushing and wet sponging to remove visible asbestos, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Consultant, apply continuous coat of slow-drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.

3.4 FINAL CLEANUP

.1 Following cleaning specified in Section 3.3 above, and when air sampling shows that asbestos levels on both sides of seals do not exceed 0.01 fibres/cc as determined by membrane filter method at 400-500X magnification phase contrast illumination, as described in NIOSH 94-113 or equivalent, proceed with final cleanup.

.2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos-containing particles observed during cleanup, immediately, using HEPA vacuum equipment.

.3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.

.4 Include in clean-up Work areas, Equipment and Access Room, Washroom, Shower Room, and other contaminated enclosures.

.5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.

.6 Conduct final check to ensure that no dust or debris remains on surfaces as result of dismantling operations. Repeat cleaning using HEPA vacuum equipment, or wet cleaning methods where feasible to remove visible dust or debris.

.7 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations.

3.5 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

.1 When cleanup is complete:

.1 Re-establish objects and furniture moved to temporary locations in course of Work, in their proper positions.

.2 Re-secure mounted objects removed in course of Work in their former positions.

.3 Re-establish mechanical and electrical systems in proper working order. Install new filters.

.4 Repair or replace objects damaged in the course of Work, as directed by Consultant.

3.6 AIR MONITORING

.1 From beginning of Work until completion of cleaning operations, Consultant reserves the right to take air samples on daily basis outside of work area enclosure.

.1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial Occupational Health and Safety Regulations.

.2 Use results of air monitoring inside work area to establish type of respirators to be used. Workers may be required to wear sample pumps for up to full-shift periods.

.1 If fibre levels are above safety factor of respirators in use, stop abatement, apply means of dust suppression, and use higher safety factor in respiratory protection for persons inside enclosure.

.2 If air monitoring shows that areas outside work area enclosures are contaminated, enclose, maintain and clean these areas, in same manner as that applicable to work areas.

.3 If the work will be done indoors in a building that is not scheduled for demolition then final air monitoring to be conducted as follows: After Asbestos Work Area has passed visual inspection and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period has passed, Consultant will perform air monitoring within Asbestos Work Area.

.1 Final air monitoring results must show fibre levels of not more than 0.01 f/cc.

.2 If air monitoring results show fibre levels in excess of 0.01 f/cc, re-clean work area and apply another acceptable coat of lock-down agent to surfaces.

.3 Repeat as necessary until fibre levels are not more than 0.01 f/cc.

3.7 INSPECTION

.1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation[s] from these requirements that have not been approved in writing by Consultant may result in Work stoppage, at no cost to Owner.

.2 Consultant will inspect Work for:

.1 Adherence to specific procedures and materials.

.2 Final cleanliness and completion.

.3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur Consultant may order Work shutdown.

.1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Comply with requirements of this Section when performing the following Work:

.1 Removing lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap.

.2 Removing or disturbing lead-containing coatings using a power tool that has an effective dust collection system equipped with a HEPA filter.

.3 Removing or disturbing lead-containing coatings using non-powered hand tools, other than manual scraping or sanding.

.4 Application of a sealant or encapsulant to lead-containing coatings using a brush, roller or airless sprayer.

1.2 EXISTING CONDITIONS

.1 Information pertaining to lead-containing materials to be handled, removed, or otherwise disturbed and disposed of in the renovation area have been provided. Information is for general purposes only and is not necessarily representative of all lead-containing material covered within the scope of this project.

.2 The following paints have been identified as lead-containing as summarized in the pre-renovation designated substance information provided by CBRE and attached to these specifications:

.1 Light blue paint on concrete block walls in Room 5003 (LU Room number);

.2 Light blue paint on drywall walls in Rooms 5003 and 5005;

.3 Teal paint on metal door frames in Rooms 5003 and 5005;

.4 Purple paint on metal doors in Rooms 5003 and 5005; and

.5 Light blue paint on metal radiators in Room 5003.

.3 Drywall with lead-containing blue paint has been submitted for toxicity characteristic leaching procedure (TCLP) analysis and it has been determined to meet the requirements under Ontario Regulation 347, General - Waste Management (O. Reg. 347) to be disposed of as a non-hazardous waste. (NOTE: The laboratory certificate of analysis will be made available to the successful bidder for provision to the landfill operator prior to disposal of LC waste.)

.4 Other paints described above have not been analyzed to determine whether they meet the requirements under Ontario Regulation 347, General - Waste Management (O. Reg. 347) to be disposed of as a non-hazardous waste.

1.3 SECTION INCLUDES

.1 Requirements and procedures for minor removal or disturbance of lead-containing materials.

1.4 REFERENCES

.1 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA)

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

.1 Material Safety Data Sheets (MSDS).

.3 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.2 Transportation of Dangerous Goods Regulations (SOR/2012-245)

.4 Underwriters' Laboratories of Canada (ULC).

.5 Ontario Ministry of Labour (MOL).

.1 Occupational Health and Safety Act, 1990 (OHSA).

.2 Guideline – Lead on Construction Projects

.6 Ontario Ministry of Environment and Climate Change (MOECC)

.1 Environmental Protection Act, 1990 (EPA)

.2 Ontario Regulation 347, General - Waste Management (O. Reg. 347)

1.5 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.

.2 Lead Work Area: area where work takes place which will, or may disturb lead-containing paint.

.3 Authorized Visitors: Architect, Engineer, Consultant or designated representatives, and representatives of regulatory agencies.

.4 Occupied Area: any area of building or work site that is outside the Lead Work Area.

.5 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

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

1.6 SUBMITTALS

.1 Submit to Owner necessary permits for transportation and disposal of lead-containing waste and proof that lead-containing waste has been received and properly disposed including, but not limited to, MOECC certificates of Approval for carrier and receiver and waste manifests.

.2 Submit proof satisfactory to Owner that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Lead Work Area, and aspects of work procedures and protective measures.

.3 Submit Worker's Compensation Board status and transcription of insurance.

.4 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials.

.5 Written work procedure for disturbance of lead-containing materials.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to lead, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.

.2 Health and Safety:

.1 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing are not required for Type 1 lead operations; however, if a worker requests respiratory protection, the following is to be supplied by Contractor and worn by workers while in the Lead Work Area:

.1 Non-powered reusable or replaceable filter-type respirator equipped with HEPA filter cartridges, personally issued to worker and marked as to efficiency and purpose, suitable for protection against lead and acceptable to Provincial Authority having jurisdiction (i.e. P/N/R 95, 99 or 100).

.2 Disposable-type protective clothing that does not readily retain or permit penetration of lead dust, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.3 In the event of discrepancy between specifications and the MOL Guideline – Lead on Construction Projects, the requirements of the MOL Guideline – Lead on Construction Projects apply.

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

.3 Before leaving Lead Work Area, dispose of protective clothing as contaminated waste as specified.

.4 Ensure workers wash hands and face when leaving Lead Work Area. Facilities for washing shall be located in proximity to each work area and in a location that does not interfere with building day to day operations.

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

.2 Visitor Protection:

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

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Lead Work Area.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Notify intended waste disposal facility of lead in waste materials.

.1 Provide copies of laboratory test results, if requested.

.2 Complete and submit Contaminants Release Form and any other required paperwork to facilitate disposal.

.2 Dispose of building materials containing lead and identified as non-leachate toxic (Please refer to Section 3.3 below) as solid non-hazardous waste.

.3 Dispose of building materials containing lead and identified as leachate toxic (Please refer to Section 3.3 below) as hazardous waste. Leachate toxic waste must be transported by a properly licensed carrier to a licensed disposal facility as per the requirements of O. Reg. 347.

.4 Where possible, separate lead painted metals from regular waste stream for recycling.

.5 Dispose of lead materials in accordance with federal, provincial and municipal requirements.

1.9 SCHEDULING

.1 Contractor is responsible for scheduling of lead abatement work in order to achieve the desired renovation schedule.

.2 Co-ordinate with Consultant, Owner, Owner’s representatives and other contractors when scheduling work.

1.10 OWNER'S INSTRUCTIONS

.1 Before beginning Work, provide Consultant satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene and work practices, in the use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at minimum:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

Part 2 Products

2.1 MATERIALS

.1 Drop and Enclosure Sheets.

.1 Polyethylene: 0.15 mm thick.

.2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable polyethylene bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary lead warning, in both official languages, that is visible when ready for removal to disposal of recycling site.

Part 3 Execution

3.1 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

.2 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead containing materials.

3.2 PREPARATION AND PROCEDURE

.1 Before beginning Work, at each access to Lead Work Area, install warning signs with the following information:

.1 There is a lead dust, fume or mist hazard.

.2 Access to the work area is restricted to authorized persons.

.2 Cover ground in the Work Area with polyethylene drop sheets to prevent the spread of lead-containing paint chips, dust and debris. Seal the polyethylene drop sheet in place using tape.

.3 Before beginning Work pre-clean and remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.

.1 Use HEPA vacuum, or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.

.2 Do not use compressed air to clean up or remove dust from any surface.

.4 Prevent spread of dust from Lead Work Area using measures appropriate to work to be done.

.5 Perform work in a manner to reduce dust creation to lowest levels practicable.

.6 Work is subject to visual inspection. Contamination of surrounding areas indicated by visual inspection will require complete enclosure and clean-up of affected areas.

3.3 WASTE CHARACTERIZATION

.1 For paints identified as lead-containing, but not identified positively as to their leachate toxicity, the successful contractor shall contact the consultant to characterize the waste as follows (i.e. if it will be disposed of):

.1 Collect a representative sample of material from every waste container resulting from the removal process. Each sample must contain at least 50 grams of representative waste material.

.2 Submit the collected samples under chain of custody to an accredited laboratory for lead analysis and subsequent toxicity characteristic leachate procedure (TCLP) analysis for lead according to the requirements made under O. Reg. 347.

.3 If the results of analysis are less than 5 milligrams lead per litre (mg/L) in the leachate then the material can be disposed of as a non-hazardous waste.

3.4 CLEAN-UP

.1 Arrange for transportation and disposal of all removed lead-containing paint (Please refer to Section 1.8 above).

.2 Clean-up:

.1 Frequently during Work and immediately after completion of work, clean up lead containing dust and waste using HEPA vacuum.

.2 Place lead containing dust and waste in sealed dust-tight waste bags or drums. Treat drop sheets and disposable protective clothing as lead waste and wet and fold to contain dust and then place in waste bags.

.3 Immediately before their removal from Lead Work Area and disposal, clean exterior of each filled waste bag or drum using damp cloths or HEPA vacuum. If using bags, place in second clean waste bag.

.4 Seal and remove waste from site. Dispose in accordance with requirements of Provincial and Federal authority having jurisdiction. Ensure that dump operator is fully aware of nature of material to be dumped and that guidelines and regulations for lead waste disposal are followed.

.5 Perform final thorough clean-up of Lead Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.5 INSPECTION

.1 The following visual inspections will be completed by the Consultant over the duration of the work. The Contractor is to provide minimum 24 hours notice to the

Consultant to arrange for the inspections. Lead Abatement Work shall not proceed until each inspection is completed and approval to proceed is obtained from the Consultant.

.1 Initial Inspection: following completion of preparation of work area but prior to the commencement of lead-containing material removal.

.2 Clearance Inspection: following completion of all removal work and cleaning and sealing of all surfaces within the enclosure, but prior to removing hoarding.

.2 If results of the visual inspection suggest that lead-containing materials remain in the work area, re-clean in accordance with section 3.4 and any additional direction provided by the Consultant. Re-cleaning shall be at no additional cost to the Client.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Comply with requirements of this Section when performing the following Work:

.1 Removing or disturbing lead-containing materials by scraping or sanding using non-powered hand tools.

.2 Manual demolition of lead-painted building materials by striking with a sledgehammer or similar tool.

1.2 EXISTING CONDITIONS

.1 Information pertaining to lead containing materials (LCM) to be handled, removed or otherwise disturbed and disposed of in the renovation area has been provided. Information is for general purposes only and is not necessarily representative of all LCM covered within the scope of this project.

.2 The following paints have been identified as lead-containing as summarized in the pre-renovation designated substance information provided by CBRE and attached to these specifications:

.1 Light blue paint on concrete block walls in Room 5003 (LU Room number);

.2 Light blue paint on drywall walls in Rooms 5003 and 5005;

.3 Teal paint on metal door frames in Rooms 5003 and 5005;

.4 Purple paint on metal doors in Rooms 5003 and 5005; and

.5 Light blue paint on metal radiators in Room 5003.

.3 Drywall with lead-containing blue paint has been submitted for toxicity characteristic leaching procedure (TCLP) analysis and it has been determined to meet the requirements under Ontario Regulation 347, General - Waste Management (O. Reg. 347) to be disposed of as a non-hazardous waste. (NOTE: The laboratory certificate of analysis will be made available to the successful bidder for provision to the landfill operator prior to disposal of LC waste.)

.4 Other paints described above have not been analyzed to determine whether they meet the requirements under Ontario Regulation 347, General - Waste Management (O. Reg. 347) to be disposed of as a non-hazardous waste.

1.3 SECTION INCLUDES

.1 Requirements and procedures for intermediate removal or disturbance of lead-containing materials.

1.4 REFERENCES

.1 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA)

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

.1 Material Safety Data Sheets (MSDS).

.3 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.2 Transportation of Dangerous Goods Regulations (SOR/2012-245)

.4 Underwriters' Laboratories of Canada (ULC)

.5 Ontario Ministry of Labour (MOL).

.1 Occupational Health and Safety Act, 1990 (OHSA).

.2 Guideline – Lead on Construction Projects

.6 Ontario Ministry of Environment and Climate Change (MOECC)

.1 Environmental Protection Act, 1990 (EPA)

.2 Ontario Regulation 347, General - Waste Management (O. Reg. 347)

1.5 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.

.2 Lead Work Area: area where work takes place which will, or may disturb lead-containing paint.

.3 Authorized Visitors: Architect, Engineer, Consultant or designated representatives, and representatives of regulatory agencies.

.4 Occupied Area: any area of building or work site that is outside the Lead Work Area.

.5 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

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

1.6 SUBMITTALS

.1 Submit to Owner necessary permits for transportation and disposal of lead-containing waste and proof that lead-containing waste has been received and properly disposed

including, but not limited to, MOECC certificates of Approval for carrier and receiver and waste manifests.

.2 Submit proof satisfactory to Owner that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Lead Work Area, and aspects of work procedures and protective measures.

.3 Submit Worker's Compensation Board status and transcription of insurance.

.4 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials.

.5 Written work procedure for disturbance of lead-containing materials.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to lead, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.

.2 Health and Safety:

.1 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing are worn by workers and visitors while in the Lead Work Area:

.1 Non-powered reusable or replaceable filter-type respirator equipped with HEPA filter cartridges, personally issued to worker and marked as to efficiency and purpose, suitable for protection against lead and acceptable to Provincial Authority having jurisdiction (i.e. P/N/R 95, 99 or 100).

.2 Disposable-type protective clothing that does not readily retain or permit penetration of lead dust, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

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

.3 Before leaving Lead Work Area, dispose of protective clothing as contaminated waste as specified.

.4 Ensure workers wash hands and face when leaving Lead Work Area. Facilities for washing shall be located in proximity to each work area and in a location that does not interfere with building day to day operations.

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

.2 Visitor Protection:

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

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Lead Work Area.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Notify intended waste disposal facility of lead in waste materials.

.1 Provide copies of laboratory test results, if requested.

.2 Complete and submit Contaminants Release Form and any other required paperwork to facilitate disposal.

.2 Dispose of building materials containing lead and identified as non-leachate toxic (Please refer to Section 3.3 below) as solid non-hazardous waste.

.3 Dispose of building materials containing lead and identified as leachate toxic (Please refer to Section 3.3 below) as hazardous waste. Leachate toxic waste must be transported by a properly licensed carrier to a licensed disposal facility as per the requirements of O. Reg. 347.

.4 Where possible, separate lead painted metals, lead piping and/or water service connections, if present, from regular waste stream for recycling.

.5 Dispose of lead materials in accordance with federal, provincial and municipal requirements.

1.9 SCHEDULING

.1 Contractor is responsible for scheduling of lead abatement work in order to achieve the desired renovation schedule.

.2 Co-ordinate with Consultant, Owner, Owner’s representatives and other contractors when scheduling work.

1.10 OWNER'S INSTRUCTIONS

.1 Before beginning Work, provide Owner satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene and work practices, in the use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at minimum:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Drop and Enclosure Sheets.

.1 Polyethylene: 0.15 mm thick.

.2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable polyethylene bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary lead warning, in both official languages, that is visible when ready for removal to disposal of recycling site.

PART 3 EXECUTION

3.1 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

.2 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead containing materials.

3.2 PREPARATION AND PROCEDURES

.1 Work Area:

.1 Before beginning Work, at each access to Lead Work Area, install warning signs with the following information:

.1 There is a lead dust, fume or mist hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the Work Area.

.2 Shut off and isolate HVAC system to prevent dust dispersal into other building areas.

.3 Before beginning Work pre-clean and remove visible dust from fixed casework and equipment surfaces in work area where dust is likely to be disturbed during course of work.

.1 Use HEPA vacuum, or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.

.2 Do not use compressed air to clean up or remove dust from any surface.

.4 Cover fixed casework and equipment with polyethylene sheeting sealed with tape.

.5 Cover ground inside of the Work Area with polyethylene sheeting sealed in place with tape.

.6 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers with polyethylene sheeting sealed with tape.

.7 Create a barrier for the Work Area to prevent entry of unauthorized persons.

.8 Visually inspect Work Area and barriers at beginning of each working period.

.2 Prevent spread of dust from Lead Work Area using measures appropriate to work to be done. This includes the use of drop sheets for all work that will produce dust, chips or debris containing lead.

.3 Perform work in a manner to reduce dust creation to lowest levels practicable.

.4 Work is subject to visual inspection. Contamination of surrounding areas indicated by visual inspection will require complete enclosure and clean-up of affected areas.

3.3 WASTE CHARACTERIZATION

.1 For paints identified as lead-containing, but not identified positively as to their leachate toxicity, the successful contractor shall contact the consultant to characterize the waste as follows (i.e. if it will be disposed of):

.1 Collect a representative sample of material from every waste container resulting from the removal process. Each sample must contain at least 50 grams of representative waste material.

.2 Submit the collected samples under chain of custody to an accredited laboratory for lead analysis and subsequent toxicity characteristic leachate procedure (TCLP) analysis for lead according to the requirements made under O. Reg. 347.

.3 If the results of analysis are less than 5 milligrams lead per litre (mg/L) in the leachate then the material can be disposed of as a non-hazardous waste.

3.4 CLEAN-UP

.1 Arrange for transportation and disposal of all removed lead-containing paint (Please refer to Section 1.8 above).

.2 Clean-up:

.1 Frequently during Work and immediately after completion of work, clean up lead containing dust and waste using HEPA vacuum.

.2 Place lead containing dust and waste in sealed dust-tight waste bags or drums. Treat drop sheets and disposable protective clothing as lead waste and wet and fold to contain dust and then place in waste bags.

.3 Immediately before their removal from Lead Work Area and disposal, clean exterior of each filled waste bag or drum using damp cloths or HEPA vacuum. If using bags, place in second clean waste bag.

.4 Seal and remove waste from site. Dispose in accordance with requirements of Provincial and Federal authority having jurisdiction. Ensure that dump

operator is fully aware of nature of material to be dumped and that guidelines and regulations for lead waste disposal are followed.

.5 Perform final thorough clean-up of Lead Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.5 INSPECTION

.1 The following visual inspections will be completed by the Consultant over the duration of the work. The Contractor is to provide minimum 24 hours notice to the Consultant to arrange for the inspections. Lead Abatement Work shall not proceed until each inspection is completed and approval to proceed is obtained from the Consultant.

.1 Initial Inspection: following completion of preparation of work area but prior to the commencement of lead-containing material removal.

.2 Clearance Inspection: following completion of all removal work and cleaning and sealing of all surfaces within the enclosure, but prior to removing hoarding.

.2 If results of the visual inspection suggest that lead-containing materials remain in the work area, re-clean in accordance with section 3.4 and any additional direction provided by the Consultant. Re-cleaning shall be at no additional cost to the Client.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Comply with requirements of this Section when performing the following Work:

.1 Removing or disturbance of lead-containing materials using power tools without an effective dust collection system equipped with a HEPA filter.

1.2 EXISTING CONDITIONS

.1 Information pertaining to lead-containing materials to be handled, removed, or otherwise disturbed and disposed of in the renovation area has been provided. Information is for general purposes only and is not necessarily representative of all lead-containing material covered within the scope of this project.

.2 The following paints have been identified as lead-containing as summarized in the pre-renovation designated substance information provided by CBRE and attached to these specifications:

.1 Light blue paint on concrete block walls in Room 5003 (LU Room number);

.2 Light blue paint on drywall walls in Rooms 5003 and 5005;

.3 Teal paint on metal door frames in Rooms 5003 and 5005;

.4 Purple paint on metal doors in Rooms 5003 and 5005; and

.5 Light blue paint on metal radiators in Room 5003.

.3 Drywall with lead-containing blue paint has been submitted for toxicity characteristic leaching procedure (TCLP) analysis and it has been determined to meet the requirements under Ontario Regulation 347, General - Waste Management (O. Reg. 347) to be disposed of as a non-hazardous waste. (NOTE: The laboratory certificate of analysis will be made available to the successful bidder for provision to the landfill operator prior to disposal of LC waste.)

.4 Other paints described above have not been analyzed to determine whether they meet the requirements under Ontario Regulation 347, General - Waste Management (O. Reg. 347) to be disposed of as a non-hazardous waste.

1.3 SECTION INCLUDES

.1 Requirements and procedures for major removal or disturbance of lead-containing materials.

1.4 REFERENCES

.1 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA)

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

.1 Material Safety Data Sheets (MSDS).

.3 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.2 Transportation of Dangerous Goods Regulations (SOR/2012-245)

.4 Underwriters' Laboratories of Canada (ULC).

.5 Ontario Ministry of Labour (MOL).

.1 Occupational Health and Safety Act, 1990 (OHSA).

.2 Guideline – Lead on Construction Projects

.6 Ontario Ministry of Environment and Climate Change (MOECC)

.1 Environmental Protection Act, 1990 (EPA)

.2 Ontario Regulation 347, General - Waste Management (O. Reg. 347)

1.5 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.

.2 Lead Work Area: area where work takes place which will, or may disturb lead-containing paint.

.3 Authorized Visitors: Architect, Engineer, Consultant or designated representatives, and representatives of regulatory agencies.

.4 Occupied Area: any area of building or work site that is outside the Lead Work Area.

.5 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

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

.7 DOP Test: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.

.8 Negative pressure: system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.

.1 System to maintain minimum pressure differential of 0.02 inches of water relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.

.9 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.

.10 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:

.1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.

.2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.

.3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.

1.6 SUBMITTALS

.1 Submit to Owner necessary permits for transportation and disposal of lead-containing waste and proof that lead-containing waste has been received and properly disposed including, but not limited to, MOECC certificates of Approval for carrier and receiver and waste manifests.

.2 Submit proof satisfactory to Owner that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Lead Work Area, and aspects of work procedures and protective measures.

.3 Submit Worker's Compensation Board status and transcription of insurance.

.4 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials.

.5 Written work procedure for disturbance of lead-containing materials.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to lead, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.

.2 Health and Safety:

.1 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing are worn by workers and visitors while in the Lead Work Area:

.1 Lead removal using power tools (not equipped with HEPA filter): Full facepiece supplied-air respirator operated in demand mode.

.2 Lead removal using abrasive blasting: Type CE abrasive-blast supplied air respirator operated in a positive pressure mode with a tight-fitting half-mask facepiece.

.3 Disposable-type protective clothing that does not readily retain or permit penetration of lead dust, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.2 Requirements for workers:

.1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clan coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels and similar uncontaminated articles in clean change room.

.2 Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

.3 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not to use this system as means to leave or enter Work Area.

.3 Eating, drinking, chewing, and smoking are not permitted in Lead Work Area.

.4 Before leaving Lead Work Area, dispose of protective clothing as contaminated waste as specified.

.5 Ensure workers wash hands and face when leaving Lead Work Area. Facilities for washing shall be located in proximity to each work area and in a location that does not interfere with building day to day operations.

.6 Ensure that no person required to enter a Lead Work Area has facial hair that affects seal between respirator and face.

.2 Visitor Protection:

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

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Lead Work Area.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Notify intended waste disposal facility of lead in waste materials.

.1 Provide copies of laboratory test results, if requested.

.2 Complete and submit Contaminants Release Form and any other required paperwork to facilitate disposal.

.2 Dispose of building materials containing lead and identified as non-leachate toxic (Please refer to Section 3.3 below) as solid non-hazardous waste.

.3 Dispose of building materials containing lead and identified as leachate toxic (Please refer to Section 3.3 below) as hazardous waste. Leachate toxic waste must be transported by a properly licensed carrier to a licensed disposal facility as per the requirements of O. Reg. 347.

.4 Where possible, separate lead painted metals from regular waste stream for recycling.

.5 Dispose of lead materials in accordance with federal, provincial and municipal requirements.

1.9 SCHEDULING

.1 Contractor is responsible for scheduling of lead abatement work in order to achieve the desired renovation schedule.

.2 Co-ordinate with Consultant, Owner, Owner's representatives and other contractors when scheduling work.

1.10 OWNER'S INSTRUCTIONS

.1 Before beginning Work, provide Owner satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene and work practices, in the use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at minimum:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

Part 2 Products

2.1 MATERIALS

.1 Drop and Enclosure Sheets.

.1 Polyethylene: 0.15 mm thick.

.2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable polyethylene bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary lead warning, in both official languages, that is visible when ready for removal to disposal of recycling site.

Part 3 Execution

3.1 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

.2 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead containing materials.

3.2 PREPARATION AND PROCEDURES

.1 Work Area:

.1 Before beginning Work, at each access to Lead Work Area, install warning signs with the following information:

.1 There is a lead dust, fume or mist hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the Work Area.

.2 Shut off and isolate HVAC system to prevent dust dispersal into other building areas.

.3 Before beginning Work pre-clean and remove visible dust from fixed casework and equipment surfaces in work area where dust is likely to be disturbed during course of work.

.1 Use HEPA vacuum, or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.

.2 Do not use compressed air to clean up or remove dust from any surface.

.4 Cover fixed casework and equipment with polyethylene sheeting sealed with tape.

.5 Install negative pressure machine system and operate continuously from installation of polyethylene sheeting until completion of final cleanup. Provide automatic continuous monitoring and recording instrument of pressure difference.

.6 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers with polyethylene sheeting sealed with tape.

.7 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.

.8 Maintain emergency and fire exits from work area, or establish alternative exits satisfactory to Authority having jurisdiction.

.2 Worker Decontamination Enclosure System:

.1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:

.1 Equipment and Access Room: construct between exit and work areas, with two curtained doorways, one to the rest of the suite, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change comfortably.

.2 Clean Room: construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.2 Construction of Decontamination Enclosures:

.1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene and seal with tape, apply two layers of FR polyethylene on floor.

.2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.3 Shower room in decontamination facility to be provided with the following:

.1 Hot and cold water or water of constant temperature not less than 40 degrees Celsius or more than 50 degrees Celsius.

.2 Individual controls inside to regulate water flow and temperature.

.3 Filtration unit for shower drain (to prevent the release of contaminated water).

.4 Prior to each shift in which a decontamination facility is being used, a competent person should inspect the facility to ensure that there are no defects that would allow lead-containing dust to escape. Defects should be repaired before the facility is used. The decontamination facility should be maintained in a clean and sanitary condition.

.3 Separation of Work Areas from Occupied Areas

.1 Barriers between Work Area and occupied area to be constructed as follows:

.1 Build suitable floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting sealed with tape, and apply 9

mm minimum thick plywood. Seal joints between plywood sheets and between plywood and adjacent materials with surface film forming type sealer, to create airtight barrier.

.2 Cover plywood barrier with polyethylene sealed with tape, as specified for work areas.

.4 Maintenance of Enclosures:

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Visually inspect enclosures at beginning of each working period.

.4 Use smoke methods to test effectiveness of barriers when directed by Consultant.

.3 Complete disturbance or removal or lead-containing materials as required.

.4 Prevent spread of dust from Lead Work Area using measures appropriate to work to be done.

.5 Work is subject to visual inspection as well as lead spot check sampling on surfaces. Contamination of surrounding areas indicated by visual inspection or spot check surface samples will require complete enclosure and clean-up of affected areas at no additional cost to the Owner.

3.3 WASTE CHARACTERIZATION

.1 For paints identified as lead-containing, but not identified positively as to their leachate toxicity, the successful contractor shall contact the consultant to characterize the waste as follows (i.e. if it will be disposed of):

.1 Collect a representative sample of material from every waste container resulting from the removal process. Each sample must contain at least 50 grams of representative waste material.

.2 Submit the collected samples under chain of custody to an accredited laboratory for lead analysis and subsequent toxicity characteristic leachate procedure (TCLP) analysis for lead according to the requirements made under O. Reg. 347.

.3 If the results of analysis are less than 5 milligrams lead per litre (mg/L) in the leachate then the material can be disposed of as a non-hazardous waste.

3.4 CLEAN-UP

.1 Arrange for transportation and disposal of all removed lead-containing materials (Please refer to Section 1.8 above).

.2 Clean-up:

.1 Frequently during Work and immediately after completion of work, clean up lead containing dust and waste using HEPA vacuum.

.2 Place lead containing dust and waste in sealed dust-tight waste bags or drums. Treat drop sheets and disposable protective clothing as lead waste and wet and fold to contain dust and then place in waste bags.

.3 Immediately before their removal from Lead Work Area and disposal, clean exterior of each filled waste bag or drum using damp cloths or HEPA vacuum. If using bags, place in second clean waste bag.

.4 Seal and remove waste from site. Dispose in accordance with requirements of Provincial and Federal authority having jurisdiction. Ensure that dump operator is fully aware of nature of material to be dumped and that guidelines and regulations for lead waste disposal are followed.

.5 Perform final thorough clean-up of Lead Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.5 INSPECTION

.1 The following visual inspections will be completed by the Consultant over the duration of the work. The Contractor is to provide minimum 24 hours notice to the Consultant to arrange for the inspections. Lead Abatement Work shall not proceed until each inspection is completed and approval to proceed is obtained from the Consultant.

.1 Initial Inspection: following completion of preparation of work area but prior to the commencement of lead-containing material removal.

.2 Clearance Inspection: following completion of all removal work and cleaning and sealing of all surfaces within the enclosure, but prior to removing hoarding.

.2 If results of the visual inspection suggest that lead-containing materials remain in the work area, re-clean in accordance with section 3.4 and any additional direction provided by the Consultant. Re-cleaning shall be at no additional cost to the Client.

END OF SECTION

PART 1 General

1.1 REFERENCES

.1 Ontario Ministry of Labour (MOL).

.1 Occupational Health and Safety Act (1990)

.1 Ontario Regulation 490/09, Designated Substance - Mercury.

.2 Ontario Ministry of Environment and Climate Change (MOECC)

.1 Environmental Protection Act, 1990 (EPA)

.1 Ontario Regulation 347, General Waste Management (O. Reg. 347)

1.2 SUMMARY

.1 Comply with the requirements of this Section when performing the following work:

.1 Removal and recycling of fluorescent light tubes.

1.3 REGULATORY REQUIREMENTS

.1 Comply with Federal, Provincial, and local requirements pertaining to mercury, provided that in case of conflict among these requirements or with these specifications the more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Fluorescent light tubes are classified as "common mercury waste" under O. Reg. 347.

.3 Common mercury waste can be transported to a common mercury waste recovery facility without being registered or manifested.

1.4 SUBMITTALS

.1 Submit proof satisfactory to Consultant that suitable arrangements have been made to recycle common mercury waste in accordance with requirements of authority having jurisdiction.

1.5 EXISTING CONDITIONS

.1 Reports and information pertaining to mercury to be handled, removed or otherwise disturbed in the renovation area have been provided. Information is for general purposes only and is not necessarily representative of all mercury-containing material covered within the scope of this project.

.2 Contractors are to satisfy themselves as to the exact quantity and location of mercury containing materials for disturbance or removal as part of the current project PRIOR TO BID CLOSE.

.3 Fluorescent light tubes are located throughout the renovation area and contain mercury vapour.

.4 Notify Consultant of mercury containing materials discovered during work and not apparent from drawings, specifications, or report pertaining to work. Do not disturb such material pending instructions from Consultant.

1.6 INSTRUCTION AND TRAINING

.1 Before commencing work, provide to Consultant satisfactory proof that every worker has had instruction and training in hazards of mercury exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at a minimum:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by a competent, qualified person.

1.7 WORKER PROTECTION

.1 Protective equipment and clothing may be worn by workers handling mercury containing materials. Recommended PPE includes:

.1 Non-powered, reusable or replaceable air-purifying half-mask respirator equipped with chemical cartridges, personally issued to the worker and marked as to efficiency and purpose, suitable for protection against mercury and acceptable to the Provincial Authority having jurisdiction.

.2 Disposable-type protective clothing consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.3 Chemical-resistant protective gloves.

1.8 GENERAL

Not used.

PART 2 Products

2.1 NOT USED.

PART 3 Execution

3.1 PROCEDURES

.1 Fluorescent light tubes:

.1 Collect and separate fluorescent light tubes and keep separate from other waste.

.2 Gather and store tubes in a manner to avoid breakage.

.2 Make arrangements for removal and transport of common mercury waste to a common mercury waste recovery facility as per Section 1.3 above.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete.

.2 Section 09 22 16 - Non-Structural Metal Framing

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Steamless.
- .2 ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
- .2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)
- .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .4 CSA W59-1989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.4 The Environmental Choice Program
- .1 CCD-047a-98, Paints, Surface Coatings.
- .2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.4 SUBMITTALS

.1 Product Data:
- .1 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
  - .1 For finishes, coatings, primers and paints.

.2 Shop Drawings
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:
- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Storage and Protection:
- .1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
- .2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300Wor 350W

.2 Channels, Angles and Plates: CAN/CSA G40.21, Grade 300W.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307

.6 Shop paint for steel without finish coat: CISC/CPMA 1-73a. (No lead-based paints allowed.)

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600g/m^2 to CAN/CSA-G164.

.2 Shop coat primer: to CAN/CSA-S16-01.

.3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 SHOP PAINTING

.1 Clean, prepare surfaces and shop paint structural steel in accordance with CAN/CSA-S16-01 except where members to be encased in concrete.

.2 Paint: For shop coat and field touch-up, CISC/CPMA Standard 1-73a, a Quick-Dry one-coat paint for use on Structural Steel.

.3 Clean members, remove loose mill scale, rust, oil, dirt and other foreign matter. Prepare surface according to SSPC-SP-6. Where steel surfaces are exposed to view, use power tool cleaning to SSPC-SP-3.

.4 Apply one coat of paint in shop to steel surfaces to achieve minimum dry film thickness of 1.5 to 2.5 mils, except:
- .1 Surfaces to be encased in concrete.
- .2 Surfaces and edges to be field welded.
- .3 Faying surfaces of friction-type connections.
- .4 Surfaces to receive spray fireproof coating

.5 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.

.6 Thoroughly work paint into all joints and open surfaces.

.7 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.

.8 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

2.5 WALL SUPPORT

.1 Wall Support:
- .1 89 x 89 x 4.8 x 1150mm high (site verify) HSS with 10mm base plate anchor to concrete slab with 2 - 10mm x 89mm expansion bolts into concrete slab.
- .2 Coordinate fabrication and installation with Section 09 22 16 - Non-Structural Metal Framing.

Part 3 Execution

3.1 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

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

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 07 54 23 - EPDM Roofing

.2 Section 08 71 10 - Door Hardware - General.

1.3 REFERENCES

.1 American National Standards Institute (ANSI)
- .1 ANSI A208.1-1999, Particleboard, Mat Formed Wood.

.2 American Society for Testing and Materials (ASTM)
- .1 ASTM A653/A653M-01a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.
- .2 ASTM D1761-00, Standard Test Methods for Mechanical Fasteners in Wood.
- .3 ASTM D5456-01ae1, Specification for Evaluation of Structural Composite Lumber Products.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-11.3-M87, Hardboard.
- .2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
- .3 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.4 Canadian Standards Association (CSA)
- .1 CSA O80 Series-97, Wood Preservation.
- .2 CSA B111-1974, Wire Nails, Spikes and Staples.
- .3 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 CSA O112 Series-M1977, CSA Standards for Wood Adhesives.
- .5 CSA O121-M1978, Douglas Fir Plywood.
- .6 CAN/CSA-O122-M89, Structural Glued-Laminated Timber.
- .7 CAN/CSA-O141-91, Softwood Lumber.
- .8 CSA O151-M1978, Canadian Softwood Plywood.
- .9 CSA O153-M1980, Poplar Plywood.
- .10 CAN/CSA-O325.0-92(R1988), Construction Sheathing.
- .11 CAN3-O437 Series-93, Standards on OSB and Waferboard.

.5 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.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.7 National Lumber Grades Authority (NLGA)
- .1 Standard Grading Rules for Canadian Lumber 2005.

.8 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)

.1 SCAQMD Rule 1113-04, Architectural Coatings.
.2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

1.4 QUALITY ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

.3 Wood materials to be certified by Forest Stewardship Council.

.4 Indoor Environmental Quality: Low - Emitting Materials: Composite Wood and Laminates Adhesives.
.1 SCAQMD Rule 1168, Adhesives and Sealants Applications.

1.5 SUBMITTALS

.1 Certificates
.1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
.2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
.1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
.2 Moisture content after drying following treatment with water-borne preservative.
.3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and the Waste Reduction Workplan, and the Waste Management plan to the maximum extent economically possible.

.2 Separate wood waste in accordance with the Waste Management Plan and place in designated areas in the following categories for recycling: Solid wood/softwood/hardwood and treated, painted, or contaminated wood.

.3 Separate wood waste in accordance with the Waste Management Plan and place in designated areas in the following categories for re-use on site: sheet materials larger than 610 x 610, framing members larger than 400mm, multiple cutoffs of sizes larger than 400mm.

.4 Set aside damaged wood and dimensional lumber off-cuts for approved alternative uses (e.g. bracing, blocking, cripples, bridging). Store this separated reusable wood waste convenient to cutting station and area of work.

.5 Separate metal, plastic, wood and corrugated cardboard-packaging in accordance with the Waste Management Plan and place in designated areas for recycling.

.6 Do not burn scrap wood. All unused wood to be chipped on site in accordance with Section 31 11 00 - Clearing and Grubbing.

.7 Do not dispose of preservative treated wood through incineration

.8 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

.9 Dispose of unused wood preservative material at official hazardous material collections site approved by Consultant.

.10 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

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

Part 2 Products

2.1 FRAMING AND STRUCTURAL MATERIALS

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
- .1 CAN/CSA-O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 Forest Stewardship Council (FSC) certified.

.2 Preservative: to CSA-O80 Series, odourless, water-borne, for clear and stained finish as indicated.

.3 Glued end-jointed (finger-jointed) lumber is not acceptable.

.4 Light-frame trusses in accordance with "Truss Design and Procedures for Light Metal Connected Wood Trusses", Truss Plate Institute of Canada.

.5 Structural Composite Lumber (SCL) in accordance with ASTM D5456.

.6 Framing and board lumber: in accordance with NBC, except as follows:
- .1 Structural Joists and Planks: S-P-F species, NLGA No.2 grade. Smaller dimension 38 to 89; Larger dimension 114 or more.
- .2 Beams and Stringers: S-P-F species, NLGA No.2 grade. Smaller dimension 114 or more; Larger dimension exceeds smaller dimension by more than 51.
- .3 Posts and Timbers: S-P-F species, NLGA No.2 grade. Smaller dimension 114 or more; Larger dimension exceeds smaller dimension by 51 or less.
- .4 Plank Decking: S-P-F species, NLGA Commercial grade. Smaller dimension 38 to 89; Larger dimension 140 or more.

.7 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
- .1 S2S is acceptable for these purposes.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.
- .4 Post and timbers sizes: "Standard" or better grade.

.8 Canopy and Bench Lumber:
- .1 Provide clear, dressed lumber, free of blemishes, S4S, unless otherwise indicated.
- .2 Provide dry lumber with 12 percent maximum moisture content at time of dressing for 2- inch nominal (38-mm actual) thickness or less, unless otherwise indicated.
- .3 Sand off grade marks and other markings.
- .4 Refer to Section 09 91 10 - Painting for wood finishing.
- .5 Glue Laminated Timbers

.1 Manufacture structural glued-laminated members in plant certified by CSA as meeting requirements of CAN/CSA-O177, class X.
.2 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.
.3 Place authorization labels on glued-laminated members indicating manufactured in CSA certified plant.
.4 Laminating stock: Lodgepole Pine and/or Spruce to CAN/CSA-O122.
.5 Size: as indicated.
.6 Adhesive: to CSA O112 Series, to grade of service required in accordance with CAN/CSA-O122.
.7 Sealer for glued-laminated members: penetrating type, clear, non-yellowing liquid. Confirm compatibility with specified finish prior to sealing.
.8 Fastenings:
  .1 Shear plate connections.
  .2 Pressed steel type: hot rolled carbon steel, SAE 1010, meeting requirements of SAE handbook.
  .3 Lag screws: to ASTM A307.
  .4 Bolts: to ASTM A307.
  .5 Side plates: to CAN/CSA-G40.20/G40.21 or ASTM A36.
  .6 Drift pins: to ASTM A307.
  .7 Glued-laminated rivets: CAN/CSA-G40.20/G40.21.
  .8 Nails and spikes: to CSA B111.
.9 Shop coat primer for steel connections: to CAN/CGSB-1.40.
.10 Galvanizing: to CAN/CSA-G164, hot dipped, minimum zinc coating of 610 g/m^2.
.11 Fabricate members to following classifications:
  .1 Stress grade: to 20f-E bending grade.
  .2 Service grade: Exterior.
  .3 Appearance grade: Quality.
.12 Mark laminated members for identification during erection. Marks not to be visible in final assembly.
.13 Do not apply sealer to areas which are to receive stained finish or preservative treatment.
.14 Design connections to CAN/CSA-O86, and CAN/CSA-S16 unless specifically detailed, to resist shears, moments and forces indicated.
.15 Fabricate in accordance with CAN/CSA-S16.
.16 Galvanize and prime paint connections after fabrication.
.17 Refer to Section 09 91 10 - Paints and Coatings for wood finishing.
.18 Apply a peel and stick membrane equal to IKO Ice and Water Shield to top of Glu-lam beams and secure with galvanized roofing nails. Membrane not to be visible from ground in final construction.

2.2 PANEL MATERIALS

.1 Indoor Environmental Quality: Low - Emitting Materials: Composite Wood and Laminates Adhesives.
  .1 SCAQMD Rule 1168, Adhesives and Sealants Applications.

.2 Douglas fir plywood: to CSA O121, standard construction.
  .1 Urea-formaldehyde free.
  .2 Forest Stewardship Council (FSC) certified.

.3 Canadian softwood plywood (CSP): to CSA O151, standard construction.
  .1 Urea-formaldehyde free.
  .2 Forest Stewardship Council (FSC) certified.

.4 Poplar Plywood: to CSA O153, standard construction.
  .1 Urea-formaldehyde free.

.2 Forest Stewardship Council (FSC) certified.

.5 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.
.1 Urea-formaldehyde free.
.2 Forest Stewardship Council (FSC) certified.

.6 Marine Grade: APA 5/8" (16mm) B-B Marine Grade.

.7 Asphalt Fibre Boards:
.1 CPD Asphalt Fiber Expansion Joint Filler to thickness indicated.

.8 Concrete Sheathing Board:
.1 Acceptable Materials:
.1 Certainteed, GlasRoc Exterior Sheathing or equal.

2.3 PRESSURE IMPREGNATED WOOD

.1 Pressure impregnated wood preservative:
.1 Pressure impregnated wood to be treated with Alkaline Copper Quarternary (ACQ) preservative.
.2 Pressure impregnated wood shall be vacuum pressure impregnated for rot resistance in accordance with CSA O80 Series-97 Series-M89.
.3 Each piece of lumber and plywood to be identified by Canadian Wood Preservers Bureau (CWPB) certified stamp.
.4 All wood associated with the roof, all wood associated with the window framing, all wood installed on the exterior of the building, including plywood and concealed blocking and all wood in contact with ground to be pressure impregnated wood.
.5 Surface-applied wood preservative:
.1 Surface-applied wood preservative in accordance with CSA O80 Series-M89 and as recommended by pressure impregnated material manufacturer.
.2 Colour: clear

2.4 ACCESSORIES

.1 Exterior wall sheathing paper: to CAN/CGSB-51.32 single ply, spunbonded olefin as indicated.

.2 Polyethylene film: to Section 07 26 00 - Vapour Retarders.

.3 Membrane Air/Vapour Barrier to Section 07 26 00 - Vapour Retarders.

.4 Air seal: to Section 07 21 19 - Foamed-In-Place Insulation.

.5 Sealants: to Section 07 92 10 Joint Sealing.

.6 General purpose adhesive: to CSA O112 Series.

.7 Nails, spikes and staples: to CSA B111.

.8 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.9 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

.10 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, sheet metal, fibre, formed to prevent dishing. Bell or cup shapes not acceptable.

.11 Sill Gasket: FoamSealR Sill Gasket, 140mm wide by Owens Corning or equal.

2.5 FASTENER FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work, interior highly humid areas and pressure-preservative treated lumber.

Part 3 Execution

3.1 PREPARATION

.1 Store wood products.

3.2 INSTALLATION

.1 Comply with requirements of NBC 1995 Part 9 supplemented by following paragraphs.

.2 Install members true to line, levels and elevations, square and plumb.

.3 Construct continuous members from pieces of longest practical length.

.4 Install spanning members with "crown-edge" up.

.5 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.

.6 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, window blinds, facings, fascia, soffit, siding, electrical equipment mounting boards, and other wall or ceiling mounted work as indicated.

.7 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.
.1 Align and plumb faces of furring and blocking to tolerance of 1:600.

.8 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.9 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

.10 Install sleepers as indicated.

.11 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

3.3 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work.

.3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.4 DOORS, FRAMES AND HARDWARE

.1 Accept doors, frames and hardware from manufactures and store on site.

.2 Install frames in accordance with Section 08 11 14 - Metal Doors and Frames.

.3 Prepare solid core wood and hollow metal doors and install hardware and glazing in accordance with hardware and door manufacturer's written instructions and in accordance with Section 08 11 14 - Metal Doors and Frames, Section 08 14 10 - Flush Wood Doors, Section 08 71 10 - Door Hardware - General and Section 08 80 50 - Glazing. Manufacturer's instructions shall take precedence.

.4 Install doors plumb and level.

.5 Adjust door, frame and/or hardware to suit plumb and level installation.

3.5 PREPARATION FOR APPLICATION OF WOOD PRESERVATIVE

.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.

.4 Treat material as follows :
.1 Wood furring on outside surface of exterior masonry and concrete walls.

.5 Following water-borne preservative treatment, dry material to maximum moisture content of 6%.

END OF SECTION

eneral

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 05 50 00 - Metal Fabrications
.2 Section 06 10 10 - Rough Carpentry.
.3 Section 07 92 10 - Joint Sealing.
.4 Section 09 91 10 - Painting.

1.3 REFERENCES

.1 American National Standards Institute (ANSI)
  .1 ANSI A208.1-99, Particleboard.
  .2 ANSI A208.2-94, Medium Density Fiberboard (MDF).
.2 American Society for Testing and Materials (ASTM)
  .1 ASTM E1333-96, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
  .2 ASTM D2832-92(R1999), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  .3 ASTM D5116-97, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
  .1 AWMAC Quality Standards for Architectural Woodwork , 1994.
.4 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
.5 Canadian Standards Association (CSA)
  .1 CSA B111-74(R1998), Wire Nails, Spikes and Staples.
  .2 CSA O112.4-M1977(R1999), Standards for Wood Adhesives.
  .3 CSA O112.5-Series-M-1977(R1999), Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).
  .4 CSA O112.7-Series M-1977(R1999), Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).
  .5 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.
  .6 CSA O121-M89(R1998), Douglas Fir Plywood.
  .7 CAN/CSA O141-91R1999, Softwood Lumber.
  .8 CSA O151-M1978(R1998), Softwood Plywood.
  .9 CSA O153-M1980(R1998), Poplar Plywood.
  .10 CSA Z760-94, Life Cycle Assessment.
.6 National Electrical Manufacturers Association (NEMA)
  .1 NEMA LD-3-95.
.7 National Hardwood Lumber Association (NHLA)
  .1 Rules for the Measurement and Inspection of Hardwood and Cypress , January 1996.
.8 National Lumber Grades Authority (NLGA)
  .1 Standard Grading Rules for Canadian Lumber , 2000.

1.4 SUBMITTALS

.1 Shop Drawings
  .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  .2 Indicate details of construction, profiles, jointing, fastening and other related details. Scales: 1/4 full size.
  .3 Indicate materials, thicknesses, finishes and hardware.

.4 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

.2 Samples

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

.2 Submit duplicate samples: sample size 300 x 300 mm or 300mm long unless specified otherwise of shop applied wood finish.

.3 Submit duplicate colour samples of laminated plastic for colour selection.

.4 Submit duplicate samples of laminated plastic joints, edging, cutouts and postformed profiles.

1.5 MOCK-UPS

.1 Construct millwork mock-ups in accordance with Room Mock-Up Schedule in Section 01 45 00 - Quality Control complete with hardware and shop applied finishes, and install on project in designated location.

.2 Allow 24 hours for inspection of room mock-up by Consultant before proceeding with this work.

.3 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Protect materials against dampness during and after delivery.

.3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and the Waste Reduction Workplan, to the maximum extent economically possible.

.2 Separate wood waste in accordance with the Waste Management Plan and place in designated areas in the following categories for recycling: Solid wood/softwood/hardwood, composite wood, treated, painted, or contaminated wood.

.3 Separate wood waste in accordance with Waste Management Plan and place in designated areas in the following categories for re-use on site: sheet materials larger than 400, framing members larger than 400mm, multiple off cuts of sizes larger than 400mm.

.4 Set aside damaged wood for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger-joining, or ties). Store this separated reusable wood waste convenient to cutting station and area of work.

.5 Do not burn scrap wood. All unused wood to be chipped on site in accordance with Section 31 11 00 - Clearing and Grubbing.

.6 Separate corrugated cardboard in accordance with Waste Management Plan and place in designated areas for recycling.

.7 Do not burn scrap at the project site.

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

1.8 EXTENDED WARRANTY

.1 Contractor hereby warrants that laminated plastic work will not warp or delaminate in accordance with GC 12.3, but for two years.

.2 Contractor hereby warrants that wood doors will not warp, twist, show core lines, split, delaminate or sag in accordance with GC 12.3 for three years.

Part 2 Products

2.1 MATERIALS

.1 Provide materials that contain no urea-formaldehyde.

.2 Softwood lumber: unless specified otherwise, S4S, moisture content 19 % or less in accordance with following standards:

- .1 CAN/CSA-O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 AWMAC premium grade SPF, moisture content as specified.

.3 Machine stress-rated lumber is acceptable for all purposes.

.4 Hardwood lumber: moisture content 6 % or less in accordance with following standards:

- .1 National Hardwood Lumber Association (NHLA).
- .2 AWMAC premium grade, White Maple Species.
- .3 Manufacturing process must adhere to Lifecycle Assessment (LCA) Standards as per ISO 14040/14041 LCA Standards, CSA Z760 LCA Standards.

.5 Douglas fir plywood (DFP): to CSA O121, must not contain any added urea-formaldehyde.

.6 Canadian softwood plywood (CSP): to CSA O151, must not contain any added urea-formaldehyde.

.7 Hardwood plywood: to CSA O115 White Maple species must not contain any added urea-formaldehyde.

.8 Poplar plywood (PP): to CSA O153, must not contain any added urea-formaldehyde.

.9 Particleboard: to ANSI A208.1 must not contain any added urea-formaldehyde.

.10 Hardboard: to CAN/CGSB-11.3.

- .1 to be urea-formaldehyde free and contain 100 % recycled materials.

.11 Medium density fibreboard (MDF): to ANSI A208.2, density 640-800 kg/m^3 must not contain any added urea-formaldehyde.

.12 Manufacturing process must adhere to Lifecycle Assessment Standards as ISO 14040/14041 LCA Standards, CSA Z760 LCA Standards.

.13 Laminated plastic for flatwork: to NEMA LD3, Grade 10/HGS, 1.27 mm thick; based on solid or printed pattern with satin or textured finish from colour range. Use acid and chemical resistant grade plastic laminate on countertops where indicated.

- .1 Up to five (5) colours and patterns may be selected from full range from WilsonArt, Formica and Arborite or other approved laminate manufacturer.

.14 Post Forming Laminate:

- .1 Thickness: F39 (HGP) Horizontal Postforming Grade = 1.0mm ± .12mm.
- .2 Manufactured by pressing melamine resin impregnated decorative paper over layers of phenolic resin impregnated kraft paper.
- .3 Up to five (5) colours and patterns may be selected from full range from WilsonArt, Formica and Arborite or other approved laminate manufacturer.

.15 Laminated plastic backing sheet: Grade BK, Type LD not less than 0.5 mm thick or same thickness and colour as face laminate.

.16 Thermofused Melamine: to NEMA LD3 Grade VGL,Thickness as indicated.

- .1 High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).

.17 Nails and staples: to CSA B111.

.18 Wood screws: plain, type and size to suit application.

.19 Splines: wood.

.20 Sealant: to Section 07 92 10 - Joint Sealing.

.21 Laminated plastic adhesive(must not contain any added urea-formaldehyde): urea resin adhesive to CSA O112.5, contact adhesive to CAN/CGSB-71.20, resorcinol resin adhesive to CSA O112.7, polyvinyl adhesive to CSA O112.4, two component epoxy thermosetting adhesive.

- .1 Test for acceptable VOC emissions in accordance with ASTM D2369 and ASTM D2832.

2.2 MANUFACTURED UNITS

.1 Coordinate metal supports with Section 055000 - Metal Fabrications.

.2 Fabricate Millwork to AWMAC premium quality grade for Plastic Laminate Veneer Units and as follows:

- .1 Top and Back Stretcher Rails: prefabricated rails

.2 Horizontal Back Support Rail: 19 mm plywood core.
.3 Cabinet Bottoms: 19mm Birch Veneer with plywood core.
.4 Upper Cabinet Backs: 19mm Birch Veneer with plywood core, recessed 19 mm and set into ends.
.5 Lower Cabinet Backs: 19mm Birch Veneer with plywood core, recessed 19 mm and set into ends.
.6 Toe Space: 2 x 19 mm separate plywood base, closed to cabinet bottom, 102 mm high x 75 mm deep reinforced with securing blocks.
.1 Apply 3mm PVC edging on underside of all bases where in contact with the floor and exposed in final design.
.7 Cabinet Gables and Gable Ends: 19mm Birch Veneer with plywood core. Provide System 32 shelf support holes at 32mm o.c. generally where shelves are indicated.
.1 Apply 3mm PVC edging on underside of gable ends where in contact with the floor and exposed in final design.
.8 Free-Standing Gable Ends: 2-19mm Birch Veneer with plywood core.
.1 Apply 3mm PVC edging on underside of all free-standing gable ends where in contact with the floor and exposed in final design.
.9 Filler pieces: to match adjacent millwork surface, scribe to fill joint between millwork and adjacent wall and custom fitted around owner supplied appliances. Fill top and bottom of upper cabinets at filler pieces and corner units.
.10 Cabinet Doors: 19mm Birch Veneer particleboard.
.11 Adjustable Shelves: 19mm Birch Veneer with plywood core all surfaces.
.12 Cabinet Drawers:
.1 Fronts: 19mm Birch Veneer with particle board core.
.2 Drawer box and bottom: 13mm thermofused melamine, Panolam melamine, S411 Oxford White, Satin
.13 Edging:
.1 6mm hardwood edging typical at all door and drawer edges.
.2 1.27mm plastic laminate edging to match cabinet at all exposed open shelves and cabinet bodies.

.3 Countertops Schedule
.1 19mmParticleboard (CTP1):
.1 19mm postformed particleboard, plastic laminate covered, 38mm D-Wrap edge with exposed ends finished to match top, with 102mm integral backsplash as indicated on Interior Elevations. Stop side splashes at start of D-Wrap.
.2 At seating locations only, seal underside of counters to ensure a smooth finish or provide a double thickness of plastic laminate finished particleboard flush with underside of nosing (glue only, no screws).
.2 Provide 19 x 64 solid wood cleats for shelf supports as required.
.3 Provide 90 x 90 plywood angle cleats where counter tops span more than 305mm at unsupported edge.

2.3 CASEWORK HARDWARE

.1 Drawer and case door pulls:
.1 Richelieu:1076CV Functional Metal Handle Pull, 102c/c, chrome finish.
.2 Case door hinges-concealed:
.1 Case door hinges-concealed:
.2 Blum or Hafele:
.1 Standard: 175° opening, friction fit, suitable for use in particle board doors.
.2 Adjacent to vertical service: 85° opening, friction fit.
.3 Use BLUMOTION or equal silent closing hinges.
.4 Use hinge insertion plugs and system screws.
.3 Case door silencers (2 per door):
.1 3M: model SJ5302 bumpons.
.4 System 32 shelf supports:
.1 PLam Shelf: Hafele: 282.11.707 (4 per shelf).

.5 Drawer slides:
.1 Hafele: self closing, ball-bearing slide, Model 3732, full extension, lengths to suit drawer.

2.4 FABRICATION

.1 Set nails and countersink screws apply stained wood filler to indentations, sand smooth and leave ready to receive finish.
.2 Shop install cabinet hardware for doors, shelves and drawers.
.3 Shelving to cabinetwork to be adjustable unless otherwise noted.
.4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
.5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
.6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
.7 Ensure adjacent parts of continuous laminate work match in colour and pattern.
.8 Where indicated, veneer 1.2mm laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400mm. Keep joints 600 mm from sink cutouts.
.9 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
.10 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
.11 Apply laminate backing sheet to reverse side of core of plastic laminate work.
.12 Apply laminated plastic liner sheet to interior of cabinetry.
.13 Drill System 32 holes from 64mm above bottom to 64mm below top of cabinet.

2.5 WOOD FINISHING

.1 Wood components with a clear or stained finish to be finished by Section 06 40 00 - Architectural Woodwork under controlled conditions within the millwork shop and transported to site. Touch up work as required on site. Repairs to appear seamless in final construction.
.2 Refer to Room Finish Schedule, Interior Elevations and Millwork Sections for material locations and details.
.1 White Birch hardwood components.
.2 Dressed Lumber: (Millwork and window sill trims, etc.)
.3 INT 6.3K Polyurethane, Clear, three coats:
Submit two (2) 300 x 300 samples for Consultant approval prior to commencing with fabrication.

Part 3 Execution

3.1 INSTALLATION

.1 Do architectural woodwork to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
.2 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
.3 Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets.
.4 Use draw bolts in countertop joints.
.5 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
.6 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant.
.7 Apply water resistant building paper over wood framing members in contact with masonry or cementitious construction.

.8 Fit hardware accurately and securely in accordance with manufacturer's written instructions.
.9 For site application, offset joints in plastic laminate facing from joints in core.
.10 Window Sills
.1 Install sills plumb, level and in accordance with approved shop drawings, project installation details using manufacturers approved adhesive.
.2 No joints allowed in sill unless indicated.
.3 Allow 3mm expansion gap at edges and seal with sealant at joint between sill and adjacent jamb and window frame.
.11 Acoustic Panel Installation: refer to drawings for panel installation details.

3.2 CLEANING

.1 Clean millwork and cabinet work inside cupboards and drawers] andoutside surfaces.
.2 Remove excess glue from surfaces.

3.3 PROTECTION

.1 Protect millwork and cabinet work from damage until final inspection.
.2 Cover finished laminated plastic veneered surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means. Do not remove until immediately before final inspection.
.3 Do not use laminated surfaces for storage of equipment or other construction material or as a support for other work.

3.4 KEYING

.1 Millwork locks in each room to be keyed the same. Each room to be individually keyed to master key system.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 07 26 00 - Vapour Retarders.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).
- .1 ASTM E96-00e1, Test Methods for Water Vapour Transmission of Materials.
- .2 ASTM C208-95(R2001), Specification for Cellulosic Fiber Insulating Board.
- .3 ASTM C591-01, Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
- .4 ASTM C612-00a, Specification for Mineral Fibre Block and Board Thermal Insulation.
- .5 ASTM C1289-02, Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

.2 Canadian Gas Association (CGA).
- .1 CAN/CGA-B149.1HB-00, Natural Gas and Propane Installation Code Handbook.
- .2 CAN/CGA-B149.2-00, Propane Storage and Handling Code.

.3 Canadian General Standards Board (CGSB).
- .1 CGSB 71-GP-24M-77(R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

.4 Underwriters Laboratories of Canada (ULC).
- .1 CAN/ULC-S604-91, Type A Chimneys.
- .2 CAN/ULC-S701-01, Thermal Insulation, Polystrene, Boards and Pipe Coverings.
- .3 CAN/ULC-S702-97, Thermal Insulation, Mineral Fibre, for Buildings.
- .4 CAN/ULC-S704-01, Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

.5 Environmental Choice Program (EPC).
- .1 CCD-016-97, Thermal Insulation.

1.4 SUBMITTALS

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

.2 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bin for recycling in accordance with Waste Management Plan.

Part 2 Products

2.1 INSULATION

.1 Extruded polystyrene (XPS): to CAN/ULC-S701.
- .1 Type: III or Type IV
- .2 Compressive strength: 140kPa or 210kPa.
- .3 Thickness: as indicated.
- .4 Size: Largest sheet for intended use
- .5 Edges: shiplap edges or square as indicated.

.2 Expanded polystyrene (EPS) CAN/ULC-S701-M
- .1 Blowing Agent: CFC-HFC-HCFC Free
- .2 Type: II.
- .3 Compressive strength: 110kPa
- .4 Thickness: as indicated.
- .5 Size: Largest sheet for intended use.
- .6 Edges: square.

.3 Rigid Cellular Polyisocyanurate:
- .1 Blowing Agent: CFC-HCFC Free
- .2 Fiberglass faced, Polyisocyanurate Board Insulation: ASTM C1289, CAN/ULC C-S704. Type I, Class 1, with maximum flame-spread and smoke-developed indexes of $\leq$ 25 and $\leq$ 450, respectively, per ASTM E84.
  - .1 Minimum Compressive Strength $\geq$20 psi when tested per ASTM D1621
  - .2 Minimum Tensile Strength $\geq$1000 when tested per ASTM C209
  - .3 Minimum Flexural Strength 40 psi when tested per ASTM C203
  - .4 Water Vapor Transmission $\leq$0.95 perms per inch when tested per ASTM E96
  - .5 Water Absorption Maximum 0.1277% by volume when tested per ASTM C209
  - .6 Dimensional Stability, Maximum $\leq$2% length and width, and $\leq$3.0% thickness when tested per ASTM D2126
  - .7 Shape: flat
  - .8 Thickness: as indicated.
  - .9 Size: Largest sheet for intended use

2.2 ACCESSORIES

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

.2 Mechanical Fasteners: concrete nails with prepunched, 25mm washers.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 WORKMANSHIP

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep insulation minimum 75mm from heat emitting devices such as recessed light fixtures, and minimum 50mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

.1 Examine substrates and immediately inform Consultant in writing of defects.

.2 Prior to commencement of work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 RIGID INSULATION INSTALLATION

.1 Mechanically fasten Type III extruded polystyrene or Type II polyisocyanurate insulation boards as indicated to stud framing with fasteners and plastic washers at 150mm o.c. around perimeter of board and 305mm o.c. at intermediate supports.

.2 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150mm wide 0.15 mm modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation.

3.5 PERIMETER FOUNDATION INSULATION

.1 Exterior application: extend Type IV XPS boards to top of footings and horizontal for distance indicated on foundation drawings. Install on exterior face of perimeter foundation wall with galvanized concrete nails and washers below grade elevation.

.2 Under slab application: extend Type IV XPS boards as indicated. Lay boards on level compacted fill.

3.6 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 06 10 10 - Rough Carpentry

.2 Section 09 22 27 - Acoustical Suspension

.3 Section 07 26 00 - Vapour Retarders.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).
- .1 ASTM C553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
- .2 ASTM C665-01e1, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .3 ASTM C1320-99, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.

.2 Canadian Gas Association (CGA).
- .1 CAN/CGA-B149.1HB-00, Natural Gas and Propane Installation Code Handbook.
- .2 CAN/CGA-B149.2-00, Propane Storage and Handling Code.

.3 Canadian Standards Association (CSA International).
- .1 CSA B111-1974(R1998), Wire Nails, Spikes and Staples.

.4 Environmental Choice Program (EPC).
- .1 CCD-016-97, Thermal Insulation.

.5 Underwriters Laboratories of Canada (ULC).
- .1 CAN/ULC-S604-1991, Type A Chimneys.
- .2 CAN/ULC-S702-2009, Standard for Mineral (Glass) Fibre Insulation.

1.4 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bin for recycling in accordance with Waste Management Plan.

Part 2 Products

2.1 INSULATION

.1 Material:
- .1 Fibrous Glass Batts: preformed insulation without a membrane, sized for friction fit between framing, thermal resistance (RSI) as indicated in partition schedule.
- .2 Fibrous Mineral Wool Batts (mineral fibre): preformed mineral slag insulation without membrane, sized for friction fit between framing, thermal resistance (RSI) as indicated in partition schedule.

.2 Batt and blanket fibrous glass batts: to ASTM C665 CAN/ULC S702-97.
- .1 Unfaced Batts, Type: 1.
- .2 Thickness: as indicated.
- .3 Recycled Content: Certified by Scientific Certification Systems to contain minimum of 40% recycled product, on average of manufacturer's products.
- .4 Acceptable Manufacturers:
  - .1 Johns Manville
  - .2 Owens Corning
  - .3 Ottawa Fibre

.3 Batt and Blanket fibrous mineral wool insulation: to CAN/ULC S702-02 and CAN/ULC S102,
- .1 Type 1,
- .2 Total thickness as indicated.
- .3 Acceptable materials
  - .1 Roxul: AFB
  - .2 Thermafiber: Sound Attenuation Fire Blanket

2.2 ACCESSORIES

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

.2 Nails: galvanized steel, length to suit insulation plus 25mm, to CSA B111.

.3 Staples: 12 mm minimum leg.

.4 Tape: as recommended by manufacturer.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSULATION INSTALLATION

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.3 Do not compress insulation to fit into spaces.

.4 Keep insulation minimum 75mm from heat emitting devices such as recessed light fixtures, and minimum 50mm from sidewalls of CAN/ULC-S604 Type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.

.5 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

.1 Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in, or construction joints between fire rated wall and floor assemblies.

1.3 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

.1 Only tested firestop systems shall be used in specific locations as they apply:
- .1 Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
- .2 Safing slot gaps between edge of floor slabs and curtain walls.
- .3 Openings between structurally separate sections of wall or floors.
- .4 Gaps between the top of walls and ceilings or roof assemblies.
- .5 Expansion joints in walls and floors.
- .6 Openings and penetrations in fire-rated partitions or walls containing fire doors.
- .7 Openings around structural members which penetrate floors or walls.

1.4 RELATED WORK

.1 Section 06 10 10 - Rough Carpentry

.2 Section 09 21 11 - Gypsum Board Assemblies

.3 Section 22 00 00 - Plumbing

.4 Section 23 00 00 - Heating, Ventilating and Air Conditioning

.5 Section 26 00 00 - Electrical

.6 Fire stopping and smoke seals within mechanical assemblies (i.e inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Mechanical and Electrical divisions respectively.

1.5 REFERENCES

.1 Test Requirements: CAN/ULC-S115-11, "Standard Method of Fire Tests of Through Penetration Fire Stops".

.2 Underwriters Laboratories of Canada (ULC) of Scarborough runs CAN/ULC-S115-11 under their designation of ULC-S115-11 and publishes the results in their "FIRE RESISTANCE RATINGS DIRECTORY" that is updated annually.

.3 Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually. UL tests that meet the requirements of

ULC-S115-M are given a cUL listing and are published by UL in their "Products Certified for Canada (cUL) Directory.

.4 Omega Point Laboratories runs ASTM E-814 and publishes the results annually in their "Omega Point Laboratories Directory"

.5 Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems". These test requirements provide more guidelines for testing moving joints than that given in CAN4-S115-M. UL tests that meet the requirements of ULC-S115-M are given a cUL listing and are published by UL in their "Products Certified for Canada (cUL) Directory

.6 Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops."

.7 Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus"

.8 International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments.

.9 CAN/ULC-S102-M, Standard Test Method for Surface Burning Characteristics of Building Materials.

.10 2012 Ontario Building Code Compendium.

.11 NFPA 101 - Life Safety Code

.12 Canadian Electrical Code.

1.6 QUALITY ASSURANCE

.1 A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

.2 Firestop System installation must meet requirements of CAN/ULC-S115-11 or UL 2079 tested assemblies that provide a fire rating as shown in Clause 2.1.4 below.

.3 Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

.4 Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

.5 For those firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council.

1.7 SUBMITTALS

.1 Shop Drawings
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect all actual job conditions.

.2 Product Data
- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit manufacturer's specifications and technical data for each material including the composition and limitations, documentation of ULC or cUL firestop systems to be used and manufacturer's installation instructions.

.3 Submit manufacturer's engineering judgment identification number and drawing details when no ULC or cUL system is available for an application. Engineered judgment must include both project name and contractor's name who will install firestop system as described in drawing.

.4 Submit material safety data sheets provided with product delivered to job-site.

1.8 INSTALLER QUALIFICATIONS

.1 Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary training to install manufacture's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

.2 The work is to be installed by a contractor with at least one of the following qualifications:
- .1 FM 4991 Approved Contractor
- .2 UL Approved Contractor
- .3 Manufacturer’s Accredited Fire Stop Specialty Contractor

.3 Installer shall have not less than 3 years experience with fire stop installation.

1.9 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and ULC or cUL label where applicable.

.2 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

.3 Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.

.4 Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

.5 Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

.1 Do not use materials that contain flammable solvents.

.2 Scheduling:
- .1 Schedule installation of CAST IN PLACE firestop devices after completion of floor formwork, metal form deck, or composite deck but before placement of concrete.
- .2 Schedule installation of Drop-In firestop devices after placement of concrete but before installation of the pipe penetration. Diameter of sleeved or cored hole to match the listed system for the device.

.3 Schedule installation of other firestopping materials after completion of penetrating item installation but prior to covering or concealing of openings.

.3 Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

.4 Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

.5 During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

Part 2 Products

2.1 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with ULC-S115.
- .1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended.
- .2 Acceptable Firestop Systems
  - .1 Hilti Firestop Systems
  - .2 Tremco Fire and Smoke Containment Systems.
  - .3 Specified Technologies Inc.
  - .4 Firestop Systems Inc.
  - .5 Enerstop Firestopping Systems.

.2 Use only firestop products that have been ULC or cUL tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

.3 Provide as required to suit specific project conditions:
- .1 Pre-Installed firestop devices for use with non-combustible and combustible pipes (closed and open systems), conduit and/or cable bundles penetrating concrete floors and/or gypsum walls.
- .2 Re-penetrable, round cable management devices for use with new or existing cable bundles penetrating gypsum or masonry walls.
- .3 Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT).
- .4 Sealants or caulking materials for use with sheet metal ducts.
- .5 Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps.
- .6 Pre-formed mineral wool designed to fit flutes of metal profile deck; as a backer for spray material.
- .7 Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe.

.8 Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles.

.9 Non curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles.

.10 Wall opening protective materials for use with cUL. / ULC listed metallic and specified nonmetallic outlet boxes.

.11 Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems) tested to 50 Pa. differential.

.12 Materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways.

.13 Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways.

.14 Sealants or caulking materials used for openings between structurally separate sections of wall and floors.

.15 For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected.

.4 For penetrations through a Fire Separation wall provide a firestop system with a "F" Rating as determined by ULC or cUL as indicated below:

Fire Resistance Rating of Separation	Required ULC or cUL "F" Rating of Firestopping Assembly
30 minutes	20 minutes
45 minutes	45 minutes
1 hour	45 minutes
1.5 hours	1 hour
2 hours	1.5 hours
3 hours	2 hours
4 hours	3 hours

For combustible pipe penetrations through a Fire Separation provide a firestop system with a "F" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.5 For penetrations through a Fire Wall or horizontal Fire Separation provide a firestop system with a "FT" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.6 Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

Part 3 Execution

3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Verify penetrations are properly sized and in suitable condition for application of materials.

.3 Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

.4 Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

.5 Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

.6 Do not proceed until unsatisfactory conditions have been corrected.

.7 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.8 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2 COORDINATION

.1 Coordinate construction of openings, penetrations and construction joints to ensure that the fire stop systems are installed according to specified requirements.

.2 Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire-resistive joint systems are installed according to specified requirements.

.3 Coordinate fire stopping with other trades so that obstructions are not placed in the way prior to the installation of the fire stop systems.

3.3 INSTALLATION

.1 Regulatory Requirements: Install firestop materials in accordance with ULC Fire Resistance Directory or UL Products Certified for Canada (cUL) Directory or Omega Point Laboratories Directory.

.2 Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

.3 Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

.4 Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of ULC or cUL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

.5 Protect materials from damage on surfaces subjected to traffic.

3.4 FIELD QUALITY CONTROL

.1 Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

.2 Keep areas of work accessible until inspection by applicable code authorities.

.3 Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.

.4 Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

3.5 IDENTIFICATION & DOCUMENTATION

.1 The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project.

.2 The Documentation Form for through penetrations is to include:
- .1 A Sequential Location Number
- .2 The Project Name
- .3 Date of Installation
- .4 Detailed description of the penetrations location
- .5 Tested System or Engineered Judgment Number
- .6 Type of assembly penetrated
- .7 A detailed description of the size and type of penetrating item
- .8 Size of opening
- .9 Number of sides of assemblies addressed
- .10 Hourly rating to be achieved
- .11 Installers Name

.3 The Documentation Form for Construction Joints is to include:
- .1 A Sequential Location Number
- .2 The Project Name
- .3 Date of Installation
- .4 Detailed description of the Construction Joints location
- .5 Tested System or Engineered Judgment Number
- .6 Type of Construction Joint
- .7 The Width of the Joint
- .8 The Lineal Footage of the Joint
- .9 Number of sides addressed
- .10 Hourly rating to be achieved
- .11 Installers Name

.4 Copies of these documents are to be provided to the general contractor at the completion of the project.

.5 Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
- .1 The words: "Warning -Through Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."
- .2 Contractor's Name, address, and phone number.
- .3 Through-Penetration firestop system designation of applicable testing and inspecting agency.
- .4 Date of Installation.
- .5 Through-Penetration firestop system manufacturer's name.
- .6 Installer's Name.

3.6 ADJUSTING AND CLEANING

.1 Remove equipment, materials and debris, leaving area in undamaged, clean condition.

.2 Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

3.7 LABOUR USE TO INSTALL FIRESTOP SYSTEMS

.1 To ensure complete harmony on the project site, the installation of each scope of work is to be performed jurisdictionally correct per existing trade agreements.

END OF SECTION

SCHEDULE OF JOINT FIRESTOP SYSTEMS (UL-2079 DYNAMIC JOINTS)

A. THIS SCHEDULE IDENTIFIES REQUIREMENTS FOR ACCEPTABLE JOINT FIRESTOP SYSTEMS BASED ON BARRIER TYPE, BASIS OF BARRIER CONSTRUCTION AND JOINT TYPE. THIS IS A STANDARD JOINT FIRESTOP SCHEDULE. SOME BARRIERS AND/OR JOINT TYPES MAY NOT APPEAR ON THE DRAWING**.

B. FOR EACH JOINT, SELECT A JOINT FIRESTOP SYSTEM BASED ON ACTUAL FIELD CONDITIONS, WHICH INCLUDE BUT ARE NOT LIMITED TO JOINT WIDTH AND BARRIER TYPE.

JOINT TYPE	F-RATING (HR)	cUL-CLASSIFIED SYSTEM	
		JOINT WIDTH LESS THAN OR EQUAL TO 2"	JOINT WIDTH GREATER THAN 2", LESS THAN OR EQUAL TO 6" [4]
CONCRETE FLOOR-TO-FLOOR	1	FF-D-1012, FF-D-1013	FF-D-1012, FF-D-1013
	2	FF-D-1012, FF-D-1013	FF-D-1012, FF-D-1013
	3	FF-D-1011, FF-D-1026	FF-D-1011, FF-D-1026
	4	FF-D-1047	N/A**
EDGE OF CONCRETE FLOOR SLAB-TO-WALL	1	FW-D-1001, FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021	FW-D-1001, FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021
	2	FW-D-1001, FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021	FW-D-1001, FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021
	3	FW-D-1011, FW-D-1021[1]	FW-D-1011, FW-D-1021
	4	FW-D-1047, FW-D-1092	FW-D-1092
CONCRETE OR BLOCK WALL TO FLAT CONCRETE SLAB FLOOR (TOP-OF-WALL)	1	HW-D-0097[1], HW-D-0403	HW-D-1008, HW-D-1009
	2	HW-D-0097[1], HW-D-0403	HW-D-1008, HW-D-1009
	3	HW-D-1008[1], HW-D-0268, HW-D-0403	HW-D-1008
	4	HW-D-0261	N/A**
CONCRETE OR BLOCK WALL TO CONCRETE OVER FLUTED METAL DECK (TOP-OF-WALL)	1	HW-D-0080, HW-D-0081, HW-D-0098	HW-D-1037
	2	HW-D-0080, HW-D-0081, HW-D-0098	HW-D-1037
	3	HW-D-0294	N/A**
	4	HW-D-0294	N/A**
GYPSUM WALL TO FLAT CONCRETE SLAB FLOOR (TOP-OF-WALL)	1	HW-D-0082, HW-D-0083, HW-D-0097, HW-D-0106	HW-D-1068
	2	HW-D-0082, HW-D-0083, HW-D-0097, HW-D-0106	HW-D-1068
	3	HW-D-1008	HW-D-1008[1]
GYPSUM SHAFT WALL TO FLAT CONCRETE SLAB (TOP-OF-WALL)	2	HW-D-0342, HW-D-0572	N/A**
GYPSUM WALL TO CONCRETE OVER FLUTED METAL DECK (TOP-OF-WALL)	1	HW-D-0042*, HW-D-0049*, HW-D-0087*, HW-D-0089*, HW-D-0045, HW-D-0046*, HW-D-0076*, HW-D-0077*	N/A**
	2	HW-D-0042*, HW-D-0049*, HW-D-0087*, HW-D-0089*, HW-D-0045, HW-D-0046*, HW-D-0076*, HW-D-0077*	N/A**
	3	HW-D-0292	N/A**
	4	HW-D-0292	N/A**
CONCRETE WALL-TO-WALL	1	WW-D-0017, WW-D-0032	WW-D-1011, WW-D-1012
	2	WW-D-0017, WW-D-0032	WW-D-1011, WW-D-1012
	3	WW-D-1011[1], WW-D-0032	WW-D-1011
	4	WW-D-1047	N/A**
GYPSUM WALL-TO-CONCRETE WALL	1	WW-D-0040	N/A**
	2	WW-D-0040	N/A**

* SEE NOTE 3

** CONTACT FIRE PROTECTION SPECIALIST OR FIELD ENGINEER FOR CURRENT cUL-CLASSIFIED SYSTEM OR ENGINEER JUDGMENT DRAWING: 1-800-363-4458

NOTES:

1. CLASSIFIED SYSTEMS FOR 2" - 6" WIDE JOINTS MAY BE USED FOR JOINTS 2" WIDE AND LESS.
2. CONFIRM THAT MOVEMENT CAPABILITIES OF THE SELECTED cUL SYSTEM MEETS OR EXCEEDS THE SPECIFIED MOVEMENT RANGE OF THE PARTICULAR JOINT.
3. SYSTEMS MARKED WITH ASTERIK (*) ARE SUITABLE FOR TOP-OF-WALL JOINTS WHERE THE FLUTED METAL DECK HAS SPRAY-ON MONOKOTE MK-6/HY FIREPROOFING.
4. VERIFY ALLOWABLE JOINT WIDTH ON SPECIFIC cUL SYSTEM DRAWING.

2014.01.26

SCHEDULE OF THROUGH PENETRATION FIRESTOP SYSTEMS

A. THIS SCHEDULE IDENTIFIES REQUIREMENTS FOR ACCEPTABLE THROUGH PENETRATION FIRESTOP SYSTEMS BASED ON BARRIER TYPE, BASIS OF BARRIER CONSTRUCTION AND PENETRANT TYPE. THIS IS A STANDARD THROUGH PENETRATION FIRESTOP SCHEDULE. SOME BARRIERS AND/OR PENETRANT TYPES MAY NOT APPEAR ON THE DRAWING**.

B. FOR EACH PENETRATION, SELECT A THROUGH PENETRATION FIRESTOP SYSTEM BASED ON ACTUAL FIELD CONDITIONS, WHICH INCLUDE BUT ARE NOT LIMITED TO PENETRATION SIZE, PENETRATION TYPE, (MATERIALS), QUANTITY OF PENETRANTS, BARRIER TYPE, AND LOCATION(S) OF PENETRANT(S).

CONCRETE FLOORS

TYPE OF PENETRANT	F-RATING (HR)	cUL-CLASSIFIED SYSTEM
BLANK OPENINGS	1	FA 0006,CAJ 0055,CAJ 0090
	2	FA 0006,CAJ 0055,CAJ 0090
	3	FA 0006, CAJ 0055, CAJ 0086, FA 0014
	4	C-AJ-0081
SINGLE METAL PIPES OR CONDUIT	1	CAJ 1226, FA 1028
	2	CAJ 1011, CAJ 1226, FA 1016, FA 1028
	3	CAJ 1012, CAJ 1226, FA 1017, F-A-1066
	4	CBJ 1037, CBJ 1034, F-A-1091
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	CAJ2021, CAJ 2022, CAJ 2080
	2	CAJ2021, CAJ 2022, CAJ 2080, FA 2005, FA2012, FA 2025, FA2214, C-AJ-8177, C-AJ-2079, F-A-2013
	3	CAJ2021, CAJ 2022, CAJ 2035, CAJ 2080, FA 8023, F-A-2013
	4	N/A**
SINGLE OR BUNDLED CABLES	1	FA 3007,CAJ 3095,CAJ 3180, CAJ 3281, CAJ 3282, CAJ 3320
	2	FA 3007,CAJ 3070, CAJ 3095,CAJ 3180, CAJ 3281, CAJ 3282, CAJ 3320
	3	FA 3007,CAJ 3070, CAJ 3095,CAJ 3180, CAJ 3285, F-A-3034
	4	N/A**
CABLE TRAY	1	CAJ 4034, CAJ 4035
	2	CAJ 4034, CAJ 4035
	3	CAJ 4034, CAJ 4035, C-AJ-4017
	4	C-AJ-8095
SINGLE INSULATED PIPES	1	FA 5004, F-A-5005, FA 5015, FA 5017, CAJ 5090, CAJ 5091 CAJ 5098, F-A-5019, F-A-5042
	2	FA 5004, F-A-5005, FA 5015, FA 5017, CAJ 5090, CAJ 5091 CAJ 5090, F-A-5019, F-A-5042
	3	FA 5016, CAJ 5090, FA 5018
	4	CBJ 5006
ELECTRICAL BUSWAY	1	CAJ 6006, CAJ 6017, FA 6002, CAJ 6036
	2	CAJ 6006, CAJ 6017, FA 6002, CAJ 6036
	3	CAJ 6006, CAJ 6017
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	CAJ 7046, CAJ 7051, CAJ 7084
	2	CAJ 7046, CAJ 7051, CAJ 7084, C-AJ-7145
	3	CAJ 7046, CAJ 7051, F-A-7018
INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	2	C-AJ-7145
MIXED PENETRANTS	1	CAJ 8014, CAJ 8099, CAJ 8056, CAJ 8143, F-A-8002, C-AJ 8207
	2	CAJ 8014, CAJ 8099, CAJ 8056, CAJ 8143; C-AJ-8177, F-A-8002, C-AJ-8207
	3	CAJ 8099, CAJ 8056, C-AJ-8110
	4	CAJ 8095

CONCRETE or BLOCK WALLS

TYPE OF PENETRANT	F-RATING (HR)	cUL-CLASSIFIED SYSTEM
BLANK OPENINGS	1	CAJ 0055, CAJ 0090, C-AJ-0004
	2	CAJ 0055, CAJ 0090, C-AJ-0004
	3	CAJ 0055, CAJ 0086, C-AJ-0004
	4	C-AJ-0081
SINGLE METAL PIPES OR CONDUIT	1	CAJ 1226, WJ 1067, W-J-1226
	2	CAJ 1226, WJ 1067, W-J-1226
	3	CAJ 1226, WJ 1041, WJ 1068, W-J-1226
	4	CBJ 1034, CBJ 1037, WJ 1041, WJ 1042, WJ 1068, W-J-1226
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	CAJ 2080, CAJ 2079, CAJ 2678, WJ 2031, WJ 2032, FA 2034
	2	CAJ 2021, CAJ 2035, CAJ 2079, CAJ 2678, WJ 2031, WJ 2032, FA 2034, C-AJ-8177
	3	CAJ 2021, CAJ 2024, CAJ 2035, CAJ 2053
	4	N/A**
SINGLE OR BUNDLED CABLES	1	WJ 3036, WJ 3060, WJ 3200, CAJ 3180, CAJ 2181, CAJ 3095, CAJ 3320
	2	WJ 3036, WJ 3060, CAJ 3070, CAJ 3095, CAJ 3180, CAJ 3281, CAJ 3320
	3	CAJ 3070, CAJ 3095, CAJ 3180, CAJ 3285
	4	WJ 3050; W-J-3167
CABLE TRAY	1	WJ 4027, CAJ 4034, CAJ 4035
	2	WJ 4027, CAJ 4034, CAJ 4035, W-J-4072
	3	CAJ 4034, CAJ 4035, C-AJ-4017
	4	WJ 8007, W-J-8048
SINGLE INSULATED PIPES	1	CAJ 5090, CAJ 5091, CAJ 5061, WJ 5042
	2	CAJ 5090, CAJ 5091, CAJ 5061, WJ 5042, C-AJ-5096, C-AJ-5098, C-AJ-5265
	3	CAJ 5090, CAJ 5061
	4	CBJ 5006, WJ 5028
ELECTRICAL BUSWAY	1	CAJ 6006, CAJ 6017, CAJ 6036
	2	CAJ 6006, CAJ 6017, CAJ 6036
	3	CAJ 6006, CAJ 6017
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	CAJ 7046, CAJ 7051, WJ 7021, WJ 7022
	2	CAJ 7046, CAJ 7051, WJ 7021, WJ 7022, C-AJ-7145, W-J-7109
	3	CAJ 7046, CAJ 7051
INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	WJ 7029
	2	WJ 7029, C-AJ-7145
MIXED PENETRANTS	1	CAJ 8014, CAJ 8099, CAJ 8056, WJ 8007, CAJ 8143
	2	CAJ 8014, CAJ 8099, CAJ 8056, WJ 8007, CAJ 8143, WJ 8051; C-AJ-8177, C-AJ-8207
	3	CAJ 8041, CAJ 8056, WJ 8007, CAJ 8099, C-AJ-8110, C-AJ-8207
	4	CAJ 8095, WJ 8007

WOOD FLOOR/CEILING ASSEMBLIES

TYPE OF PENETRANT	F-RATING (HR)	cUL-CLASSIFIED SYSTEM
METAL PIPES OR CONDUIT	1	FC 1009, FC 1059
	2	FC 1009, FC 1059
NON-METALLIC PIPE OR CONDUIT	1	FC 2006, FC2007, FC2010, FC 2044, F-C-2011, F-C-2416
	2	N/A**
SINGLE OR BUNDLED CABLES	1	FC 3012, FC 3044, F-C-3094
	2	FC 3012
INSULATED PIPES	1	FC 5004, FC 5037, FC 5036, F-C-5066
	2	FC 5004, FC 5037
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	FC 7013, F-C-7043
INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	N/A**
	2	N/A**
MIXED PENETRANTS	1	FC 8003, FC 8044, F-C-8038

GYPSUM WALLBOARD ASSEMBLIES

TYPE OF PENETRANT	F-RATING (HR)	cUL-CLASSIFIED SYSTEM
METAL PIPES OR CONDUIT	1	WL 1054, WL 1058, WL 1164, W-L-1252
	2	WL 1054, WL 1058, WL 1164, W-L-1252
	3	W-L-1252
	4	WL 1110, WL 1111, WL 1165,W-L-1252
NON-METALLIC PIPE OR CONDUIT	1	WL 2028, WL 2031, WL 2061, WL 2578, HI/PV-60-01
	2	WL 2028, WL 2061, WL 2578, W-L-2061
	3	N/A**
SINGLE OR BUNDLED CABLES	1	WL 3065, WL 3111, WL 3112, WL 3334, WL 3384, WL 3395, WL 3396, WL-3310, WL-3320
	2	WL 3065, WL 3111, WL 3112, WL 3334, WL 3384, WL 3395, WL 3396, WL-3310, W-L-3320
	4	WL 3139, WL 3334
CABLE TRAY	1	WL 4011, WL 4019, WL 4038
	2	WL 4011, WL 4019, WL 4038
	4	WL 8014
INSULATED PIPES	1	WL 5028, WL 5029, WL 5047
	2	WL 5028, WL 5029, WL 5047
	4	WL 5073
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	WL 7017, WL 7040, WL 7042, WL 7155, W-L-7069 (Shaft)
	2	WL 7040, WL 7042, WL 7155, W-L-7069 (Shaft)
INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	WL 7059, WL 7153, WL 7156, WL 7151
	2	WL 7059, WL 7153, WL 7156, WL 7151
MIXED PENETRANTS	1	WL 1095, WL 8010
	2	WL 1095, WL 8010, W-L-8065, W-L-8013
	4	WL 8014
METAL PENETRANTS THROUGH SHAFT WALL (BARE & INSULATED)	1	WL-1205, WL-1206, WL-5240, WL-5261
	2	WL-1205, WL-1206, WL-5240, WL-5261

**CONTACT FIRE PROTECTION SPECIALIST OR FIELD ENGINEER FOR CURRENT cUL-CLASSIFIED SYSTEM OR ENGINEER JUDGMENT DRAWING: 1-800-363-4458

NOTES:
1. Jobsite conditions of each through-penetration firestop system must meet ALL details of the cUL-Classified System selected.
2. If jobsite conditions do not match any cUL-classified systems in the schedules above, contact 1-800-363-4458 for alternative systems or Engineer Judgment Drawings
3. Coordinate work with other trades to assure that penetration opening sizes are appropriate for penetrant locations, and vice versa.
4. For 3-hour rated gypsum walls, contact 1-800-363-4458 for a cUL-classified system or engineer judgment drawing.

2014.01.27

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

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

.2 Text to complete other various Sections containing sealant or caulking specifications, including

1.3 RELATED SECTIONS

.1 Section 06 10 10 - Rough Carpentry.

.2 Section 06 40 00 - Architectural Woodwork

.3 Section 07 62 00 - Sheet Metal Flashing and Trim

.4 Section 08 11 14 - Metal Doors and Frames

.5 Section 08 50 00 - Fibreglass Windows

1.4 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)
- .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
- .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
- .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
- .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

1.5 SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's product to describe.
- .1 Caulking compound.
- .2 Primers.
- .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.4 Submit duplicate samples of each type of material and colour.

.5 Cured samples of exposed sealants for each color where required to match adjacent material.

.6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
.1 Instructions to include installation instructions for each product used.

1.6 QUALITY ASSURANCE/MOCK-UP

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up to show location, size, shape and depth of joint s complete with back-up material, primer, caulking and sealant.

.3 Mock-up will be used:
.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.4 Locate where directed.

.5 Allow 24 hours for inspection of mock-up by Consultant before proceeding with sealant work.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may not remain as part of finished Work. Remove mock-up and dispose of materials when no longer required and when directed by Consultant.

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.

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

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

1.9 PROJECT CONDITIONS

.1 Environmental Limitations:
- .1 Do not proceed with installation of joint sealants under following conditions:
  - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
  - .2 When joint substrates are wet.

.2 Joint-Width Conditions:
- .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

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

1.10 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

2.1 MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Interior caulking:
- .1 Between interior door frame and floor areas not required to be painted, and as indicated.
  - .1 Acceptable product:
    - .1 Dow Corning 795 Building Sealant
  - .2 Colour to be selected by Consultant.
- .2 Between interior door and screen frame and wall, between drywall control joints, between drywall/masonry joints and areas required to be painted.
  - .1 Acceptable product: Sikaflex - 1a Polyurethane Sealant or equal.
  - .3 Colour to be selected by Consultant.

.2 Acoustical caulking:
  .1 Around perimeter of all non-fire rated acoustically insulated partitions where not exposed.
  .2 Around perimeter and lap joints of poly vapour barrier
  .3 Acceptable Product, Tremco Acoustical Sealant.

.3 Preformed Compressible and Non-Compressible back-up materials.
  .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
    .1 Extruded closed cell foam backer rod.
    .2 Size: oversize 30 to 50 %.
  .2 Bond Breaker Tape.
    .1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

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

3.6 APPLICATION

.1 Warm Weather Sealant Application:
- .1 Apply sealant in accordance with manufacturer's written instructions.
- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.

.2 Cold Weather Sealant Application:
- .1 The following outlines procedures and recommendations for using sealants at temperatures lower than 5° C. At temperatures below 0° C the cure rate of sealants is diminished and the presence of ice and frost on bonding surfaces becomes more likely. Both of these conditions can affect the overall cure adhesion and ultimate performance of the sealants in application.
- .2 Warm the sealant for 24 hrs prior to use.
- .3 Clean any dew, frost or ice from the substrates with an approved solvent such as MEK (methyl ethyl ketone), Toluene or Xylene.
- .4 Warm the bonding surfaces prior to surface preparation. A hair blower or space heater can be used for this purpose.
- .5 When required, primers should be treated in a similar fashion to the sealants listed above. At temperatures lower than 0° C the primers will take longer to dry than at warmer temperatures. Care should be taken to ensure adequate primer dry time prior to sealant application.
- .6 The following are specific guidelines for applying sealants based on their composition.
  - .1 Water based sealants: Water based sealants may freeze when stored at temperatures lower than 0° C. Care should be taken to store this sealant at temperatures warmer than 5° C and to follow the general cold temperature recommendations listed above.
  - .2 Solvent based Sealants: Solvent based sealants should also be stored and applied in accordance with the application procedures listed above. These sealants will cure at a slower rate at lower temperatures due to a reduced evaporation rate of their carrier solvents. Although these sealants will thicken in response to the lower temperatures they will not freeze. Warming the sealant prior to use will improve the sealant’s flow properties.
  - .3 Moisture cure sealants: Generally these one part sealants which cure by reaction with moisture vapour are also temperature dependant. Therefore they will cure at a slower rate as the temperature drops.
  - .4 Two part silicone and polyurethane sealants that cure chemically are also somewhat affected by colder temperatures in a similar manner to the one part sealants discussed above. Cold temperature application procedures listed above should also be observed when applying these sealants.
  - .5 Minimum Temperature: Optimally sealants should be applied between 40F and 80F. At temperatures between 0F and 40F, the sealant should be applied as described above. High performance moisture curing silicone and polyurethane sealants have been applied successfully at temperatures as low as -20F using these techniques.

.3 In addition to temperature the following environmental conditions can affect the cure rate of the sealants in general.

.1 Substrates: Moisture curing substrates (ie mortar, EIFS, concrete) require additional cure time in colder climates. Adequate time should be allowed for these substrates to cure prior to application of cleaners and primers prior to sealant application.

.2 Dew Point: The dew point is the temperature at which condensation can develop. If the temperature is below the dew point, the affected substrates should be cleaned with solvent using the two rag wipe method to remove the condensation prior to primer and sealant application.

.3 Wind Chill: The major effect of wind chill is the accelerated cooling affect on the substrates and sealants. This will directly affect the time available for surface preparation and sealant application. The application characteristics of cooler sealants (ie reduced flow rate) result in less efficient tooling or wet out of the sealant to the substrate.

3.7 CURING.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.8 CLEANUP.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

3.9 CAULKING SCHEDULE

.1 Caulk all interior and exterior joints under the work of this Section, except where caulking is indicated under work of other Sections, including joints indicated on Drawings and not specified herein, with Sealant Type 1; unless indicated otherwise with another Sealant Type.

.2 Perimeter joints of exterior hollow metal door and screen frames, and louvre frames, Sealant type 1, applied under work of this Section.

.3 Exposed control joints in masonry walls, Sealant Type 1, applied under work of this Section.

.4 Expansion joints in masonry walls, Integrated Sealant System, applied under work of this Section.

.5 Caulking in conjunction with flashing and sheet metal, Sealant Type 1, supplied and installed under work of Section 076200.

.6 Interior and exterior perimeter caulking and internal window frame caulking of metal windows, Sealant Type 1, supplied and installed under work of Section 085000.

.7 Caulking and sealing of pipes passing through high-performance coating surfaces. Sealant Type 2, supplied and installed under work of Section 099110.

.8 Caulking and sealing full length of exterior thresholds, Sealant Type 1, applied under the work of this Section. All exterior doors will have thresholds.

.9 Caulk control joints on interior face of exterior walls between back to back stops, with Sealant Type 1, applied under the work of this Section.

.10 Joints in conjunction with metal support assemblies, Sealant Type 3, applied under the work of Section 092216

.11 Joints in conjunction with gypsum board, Sealant Type 2, applied under the work of Section 092116.

.12 Joints in conjunction with preformed metal roofing and siding, Sealant Type 1, applied under the work of Section 076100.

.13 Caulk joint between all interior pressed steel door and screen frames and surrounding materials in all locations with Sealant Type 4, applied under work of this Section.

.14 Caulk joint between splashback and wall around vanity tops, casework and cabinetwork tops with Sealant Type 2, applied under the work of this Section.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 07 92 10 - Joint Sealing.

.2 Section 08 71 10 - Door Hardware.

.3 Section 08 80 50 - Glazing.

.4 Section 09 91 10 - Painting.

.5 Electrical: Wiring for electronic hardware.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM International)
- .1 ASTM A653/A653M-01a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B29-92(1997), Specification for Refined Lead.
- .3 ASTM B749-97, Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA International)
- .1 G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA W59-M1989(R2001), Welded Steel Construction (Metal Arc Welding) (Metric Version).

.4 Canadian Steel Door Manufacturers' Association, (CSDMA).
- .1 CSDMA, Specifications for Commercial Steel Doors and Frames, 1990.
- .2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.

.5 National Fire Protection Association (NFPA)
- .1 NFPA 80-99, Standard for Fire Doors and Fire Windows.
- .2 NFPA 252-99, Standard Methods of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC)
- .1 CAN4-S104-80(R1985), Fire Tests of Door Assemblies.
- .2 CAN4-S105-85(R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

.7 CAN/ULC-S702-97, Thermal Insulation, Mineral Fibre, for Buildings.

.8 CAN/ULC-S704-01, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.4 DESIGN REQUIREMENTS

.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.

.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.5 SUBMITTALS

.1 Shop Drawings
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed louvred, arrangement of hardware, fire rating and finishes.
- .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing, fire rating and finishes.
- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .5 Submit test and engineering data, and installation instructions.

1.6 REQUIREMENTS

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M NFPA 252 for ratings specified or indicated.

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Divert unused paint and sealant materials from landfill to official hazardous material collections site approved by Consultant.

.5 Do not dispose of unused paint and sealant materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

.6 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.7 Divert unused wood materials from landfill to recycling reuse composting facility approved by Consultant.

.8 Damaged or broken glazing materials are not recyclable. These materials must not be disposed of with materials destined for recycling.

Part 2 Products

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

.2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.2 ADHESIVES

.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

.2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.3 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.4 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type, three per door.

.2 Exterior and interior top and bottom caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

.3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.4 Metallic paste filler: to manufacturer's standard.

.5 Sealant: to Section 07 92 10 - Joint Sealing.

.6 Glazing: to Section 08 80 50 - Glazing.
- .1 Make provisions for glazing as indicated and provide necessary glazing stops including fire rated glazing kits in rated doors and frames.
- .2 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws dry glazing of snap-on type.
- .3 Design exterior glazing stops to be tamperproof.

2.5 DOOR AND SCREEN FRAME FABRICATION

.1 Frames shall be fabricated from Commercial Steel to ASTM A653/A653M with an A40 (ZF120) “galvanneal” coating.

.2 All door frames and screens to meet the STC requirements identified below.

.3 Frame shall be constructed to profiles indicated on drawings.

.4 Screen S1 to receive a 200mm high base frame and be fabricated to accommodate 25mm sealed glazing units.

.5 Base steel thickness to be 1.5mm (16 ga).

.6 Frames shall be drilled and tapped or reinforced for mortice or surface mounted hardware in accordance with the approved hardware schedule.

.7 Frame mitres to be welded in accordance with CSA W59, ground smooth and touched up.

.8 Frame anchors shall be of a type and quality to suit wall conditions and used in accordance with manufacturers instructions but not less than three anchor points per jamb.

.9 Securely attach floor anchors to inside of each jamb profile.

.10 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

.11 Drill frames for door bumpers, three per frame.

.12 Apply insulation to closed sections.

2.6 DOOR AND FRAME FABRICATION GENERAL

.1 Doors General: swing type, 44mm thick, flush, with provision for glass and/or louvre openings as indicated.

.2 Acoustic Doors:
- .1 Sheet steel faces, thickness, design, and core suitable to achieve specified STC 55 performance. (Note that STC or fire ratings may dictate the details of oversize acoustic door or frame construction.)
- .2 Acoustic core construction, longitudinal edges, mechanically inter-locked with visible edge seams.
- .3 Reinforce doors where surface-mounted hardware is required.
- .4 Drill and tap for mortised, templated hardware.
- .5 Top and Bottom Channels: Inverted, recessed, welded steel channels.
- .6 Door to be prepped for door bottom seals.

.3 Acoustic Steel Frames:
- .1 Sheet steel, metal thickness and appropriate to maintain door STC and fire ratings, mitred corners, fully welded seams.
- .2 Factory assemble and weld frames.
- .3 Acoustic frames at sound rated doors to be filled with grout at masonry walls or mineral wool insulation at stud partitions with primary and secondary acoustic perimeter seals.
- .4 door bottoms.
- .5 Acceptable Materials:
  - .1 Ambico Acoustic Series Steel Door and Frames.
  - .2 Ceco Door, Assa Abloy.
  - .3 Door Components Inc.
  - .4 Or approved equal.

.4 Blank, reinforce, drill doors and tap for either mortised, cylinder lick and deadlock in accordance with approved hardware list and electronic hardware.

.5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.6 Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

.7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.8 Manufacturer's nameplates on doors are not permitted.

2.7 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

Part 3 Execution

3.1 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

3.2 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Caulk perimeter of frames between frame and adjacent material.

.6 Maintain continuity of air barrier and vapour retarder.

3.3 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Door Hardware - General.

.2 Provide even margins between doors and jambs and doors and finished floorand thresholds as follows.
- .1 Hinge side: 1.0 mm.
- .2 Latchside and head: 1.5 mm.
- .3 Finished floor, top of carpet noncombustible sill and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

.4 Install louvres.

3.4 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.5 GLAZING

.1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 06 20 00 - Finish Carpentry.

.2 Section 08 11 14 - Metal Doors and Frames.

.3 Section 08 71 10 - Door Hardware - General.

.4 Section 08 80 50 - Glazing

1.3 REFERENCES

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
- .1 Quality Standards for Architectural Woodwork 1998.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
- .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

.3 Canadian Standards Association (CSA International).
- .1 CSA A440.2-98, Energy Performance of Windows and Other Fenestration Systems.
- .2 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.
- .3 CAN/CSA O132.2 Series-90(R1998), Wood Flush Doors.
- .4 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.
- .5 CAN/CSA-Z808-96, A Sustainable Forest Management System: Guidance Document.
- .6 CSA Certification Program for Windows and Doors 00.

.4 Environmental Choice Program (ECP).
- .1 CCD-045-92, Sealants and Caulking Compounds.
- .2 CCD-046-92, Adhesives.

.5 National Fire Protection Association (NFPA).
- .1 NFPA 80-1999, Standard for Fire Doors and Fire Windows.
- .2 NFPA 252-1999, Standard Method of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC).
- .1 CAN-4S104M-80(R1985), Fire Tests of Door Assemblies.
- .2 CAN4-S105M-85 (R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.4 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
  - .1 For caulking materials during application and curing.

.2 For door materials and adhesives.

.2 Shop Drawings:
.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate door types and cutouts for lights and louvres, sizes, core construction, transom panel construction and cutouts.

1.5 SAMPLES

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

.2 Submit two 200 x 200 mm samples of each type wood door with factory finish.

.3 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements:
.1 Wood fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Storage and Protection:
.1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.
.2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.
.3 Protect doors from scratches, handling marks and other damage. Wrap doors.
.4 Store doors away from direct sunlight.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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

.3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.4 Divert unused adhesive material from landfill to official hazardous material collections site approved by Consultant.

.5 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 All doors to be manufactured as follows:
- .1 Provide materials and products, certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria.
- .2 Provide materials that contain no urea-formaldehyde.

2.2 NON-RATED WOOD DOORS

.1 Solid Core Wood Door: to CAN/CSA-O132.2.1-90 (R2003).
- .1 Face panels: Hardwood, Grade I (Premium), quarter sliced, White Birch. Book match vertical grain veneers in paired and multiple doors in series.
- .2 Core: Proprietary Sound Dampening Core.
- .3 Door Edge: Matched with door face.
- .4 Sound Seal: Seal component kit No.12.
- .5 Basis of Design:
  - .1 Non-Rated: Baillargeon SR35-ME or approved equal..

2.3 FABRICATION

.1 Glazing: In accordance with Section 088050 - Glazing.

.2 Glazing Stops: Wood species same as door face. Metal stops for rated doors.

.3 Vertical edge strips to match face veneer.

.4 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.

.5 Radius vertical edges of double acting doors to 60 mm radius.

2.4 FINISH:

.1 Factory applied stain and sealer to be completed by door manufacturer under controlled conditions.

.2 Face, back, top, bottom and edge rails to receive sealer and minimum 2 top coats, satin finish, as per manufacturers recommendations. Sand with 320 paper between coats.

.3 Finish:
- .1 UV Finishing System: Stain and clear coat to match:
  - .1 Sand door face veneer and stiles with 180 grit paper.
  - .2 Sand door face veneer and stiles with 220 grit paper prior to stain or sealer.
  - .3 Apply two polyurethane sealer coats to door faces, stiles and top and bottom rails. Ultraviolet curing between coats.
  - .4 Sand with 280 grit finishing paper to ensure a smooth finish.
  - .5 Apply two polyurethane top coats to door faces, stiles and top and bottom rails. Ultraviolet curing between coats.
  - .6 White Birch, Flat Cut veneer with stain to match:
    - .1 Baillargeon, Light Clear, No. BC-00-25.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

.1 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.

.2 Install labelled fire rated doors to NFPA 80.

.3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.

.4 Adjust hardware for correct function.

3.3 ADJUSTMENT

.1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

3.4 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking; clean doors and frames.

.3 Clean glass and glazing materials with approved non-abrasive cleaner.

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

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 08 11 14 - Metal Doors and Frames.

.2 Section 08 14 10 - Flush Wood Doors.

.3 Section 26 00 00 - Electrical wiring for electrical components.

1.3 REFERENCES

.1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
- .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-69.17-M86(R1993), Bored and Preassembled Locks and Latches.
- .2 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981, Butts and Hinges.
- .3 CAN/CGSB-69.19-93/ANSI/BHMA A156.3-1984, Exit Devices.
- .4 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986, Door Controls (Closers).
- .5 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.
- .6 CAN/CGSB-69.22-M90/ANSI/BHMA A156.6-1986, Architectural Door Trim.
- .7 CAN/CGSB-69.24-M90/ANSI/BHMA A156.8-1982, Door Controls - Overhead Holders.
- .8 CAN/CGSB-69.28-M90/ANSI/BHMA A156.12-1986, Interconnected Locks and Latches.
- .9 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-1987, Mortise Locks and Latches.
- .10 CAN/CGSB-69.30-93/ANSI/BHMA A156.14-1991, Sliding and Folding Door Hardware.
- .11 CAN/CGSB-69.31-M89/ANSI/BHMA A156.15-1981, Closer/Holder Release Device.
- .12 CAN/CGSB-69.34-93/ANSI/BHMA A156.18-1987, Materials and Finishes.
- .13 CAN/CGSB-69.35-M89/ANSI/BHMA A156.19-1984, Power Assist and Low Energy Power Operated Doors.
- .14 CAN/CGSB-69.36-M90/ANSI/BHMA A156.20-1984, Strap and Tee Hinges and Hasps.

1.4 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet for each item in hardware list in accordance with Section 01 33 00 - Submittal Procedures.

.2 Hardware List:
- .1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.

.3 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

.4 Closeout Submittals
.1 Provide operation and maintenance data for all hardware including but not limited to door closers, locksets, door holders, electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements:
.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

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

.2 Storage and Protection:
.1 Store finishing hardware in locked, clean and dry area.

1.7 WASTE DISPOSAL AND MANAGEMENT

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

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

1.8 MAINTENANCE

.1 Extra Materials:
.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
.2 Supply two sets of wrenches for door closers, locksets and fire exit hardware.

Part 2 Products

2.1 DOOR HARDWARE

.1 Contractor to be responsible top obtain three competitive Bids for the supply of hardware in accordance with Clause 3.6 Hardware Schedule below.

.2 Payment of hardware supply FOB jobsite will be through a Hardware Allowance in accordance with Section 01 21 00 - Allowances.

2.2 FASTENINGS

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

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

.2 Furnish door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

.1 Unless otherwise directed by the Architect, install finish hardware at the following heights above finish floor:

.1	Locksets/Latchsets	1025 to centre of strike
.2	Deadlocks	1200 to centre of strike
.3	Exit Devices	1025 to centre of strike
.4	Push Plates	1050 to centre of plate
.5	Guard Bars	1070 to centre of bar
.6	Door Pulls	1050 to centre of pull

.2 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.3 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.4 Remove construction cores when directed by Consultant; install permanent cores and check operation of locks.

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

3.5 DEMONSTRATION

.1 Keying System Setup and Cabinet:
- .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards in consultation with Owner's Locksmith.
- .2 Place file keys and duplicate keys in Owner's existing key cabinet on their respective hooks.

.2 Maintenance Staff Briefing:
- .1 Brief maintenance staff regarding:
  - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
  - .2 Description, use, handling, and storage of keys.
  - .3 Use, application and storage of wrenches for door closers locksets and fire exit hardware.

.3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.6 HARDWARE SCHEDULE

.1 Owner's Hardware Requirements:
- .1 Use Schlage Original grade 1 Lock hardware only
- .2 Keyway will be in consultation with LU locksmiths.
- .3 Lockets as follows:
  - .1 ND70PD RHO 626 Classroom lock (outside lever locked and unlocked by key, inside lever always unlocked)
  - .2 ND 82 PD -RHO 626 Double Sided lock(Key on both sides) Grade 1
  - .3 ND 53 PD -RHO 626 Entrance Office(key on one side) Grade 1
  - .4 ND80 PD- RHO 626 finish Grade 1 Store Room Lock(locked all the time, entry by key only)
- .4 Panic Hardware: Von Duprin 98 or 99 Rim Panics
- .5 Closers: LCN 4040/4041
- .6 All Hardware to Domestic original, no offshore manufactured hardware accepted.
- .7 Construction cores to be provided by contractor, final cores to be supplied under contract and given to Owner for pinning and install unless noted otherwise. Construction cores will be returned to contractor.

.2 Set No.1
- .1 Double Door, D5003 - Workspace, 1930 x 2150 x 45, Hollow Metal x Hollow Metal.

6	Hinge	US26D
2	Surface Bolt	US26D
1	Passage Set	US26D
2	Surface Overhead Holder	630
2	Kick Plate	US32D
1	Astragal	

.3 Set No.2

.1 Single Door, D5003A, D5003B, D5003E, D5003F, 5003J, D5003K, D5003L - Offices, 965 x 2150 x 45, Solid Core Wood x Hollow Metal.

3	Hinge	US26D
1	Office Lock	US26D
1	Floor Stop	US26D
1	Gasketing	
1	Automatic Door Bottom	627

.4 Set No.3

.1 Single Door, D5003C - Existing IT Room, D5005a - Green Room, D5006 - Existing Office, 965 x 2150 x 45, Hollow Metal x Hollow Metal.

3	Hinge	US26D
1	Office Lock	US26D
1	Floor Stop	US26D
1	Gasketing	
1	Automatic Door Bottom	627

.5 Set. No.4

.1 Single Door, D5003D, D5003Da - Conference, D5003K - Collaboration, 965 x 2150 x 45, Solid Core Wood x Hollow Metal.

3	Hinge	US26D
1	Classroom Lock	US26D
1	Door Closer	EN
1	Kick Plate	US32D
1	Wall Stop	US26D
1	Gasketing	
1	Automatic Door Bottom	719

.6 Set No.5

.1 Single Door, D5005 - Existing Lounge, 965 x 2150 x 45,Hollow Metal x Hollow Metal.

3	Hinge	US26D
1	Classroom Lock	US26D
1	Door Closer	EN
1	Kick Plate	US32D
1	Floor Stop	US26D
1	Gasketing	
1	Automatic Door Bottom	627

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 08 11 14 - Metal Doors and Frames.

.2 Section 08 14 10 - Flush Wood Doors.

1.3 REFERENCES

.1 American National Standards Institute (ANSI).
- .1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).
- .1 ASTM C542-94(1999), Specification for Lock-Strip Gaskets.
- .2 ASTM D790-02, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- .3 ASTM D1003-00, Test Method for Haze and Luminous Transmittance of Plastics.
- .4 ASTM D1929-96(R2001)e1, Test Method for Determining Ignition Temperature of Plastics.
- .5 ASTM D2240-02b, Test Method for Rubber Property - Durometer Hardness.
- .6 ASTM E84-01, Test Method for Surface Burning Characteristics of Building Materials.
- .7 ASTM F1233-98, Test Method for Security Glazing Materials and Systems.

.3 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
- .2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
- .3 CAN/CGSB-12.5-M86, Mirrors, Silvered.
- .4 CAN/CGSB-12.8-97, Insulating Glass Units.
- .5 CAN/CGSB-12.12-[M90], Plastic Safety Glazing.
- .6 CGSB 41-GP-6M-[83], Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced.

.4 Canadian Standards Association (CSA International).
- .1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors.
- .2 CSA Certification Program for Windows and Doors 2000.

.5 Environmental Choice Program (ECP).
- .1 CCD-045-95, Sealants and Caulking.

.6 Flat Glass Manufacturers Association (FGMA).
- .1 FGMA Glazing Manual - 1997.

.7 Laminators Safety Glass Association (LSGA).
- .1 LSGA Laminated Glass Design Guide 2000.

1.4 SYSTEM DESCRIPTION

.1 Performance Requirements:
- .1 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
  - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
- .2 Size glass to withstand wind loads, dead loads and positive and negative live loads as measured in accordance with ANSI/ASTM E330.
- .3 Limit glass deflection to flexural limit of glass with full recovery of glazing materials.

1.5 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
  - .1 For glazing materials during application and curing.

.2 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.3 Samples:
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 160mm square samples of sealed glazing for each colour.

.4 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

.5 Closeout Submittals:
- .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Provide testing and analysis of glass under provisions of Section 01 45 00 - Quality Control.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Mock-ups:
- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up to including frame and glazing, and perimeter air barrier and vapour retarder seal.
- .3 Mock-up will be used:
  - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Locate where directed.
- .5 Allow 24 hours for inspection of mock-up before proceeding with work.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

.5 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.7 SITE CONDITIONS

.1 Environmental Requirements:
- .1 Install glazing sealant when ambient temperature is 10degrees C minimum. Maintain ventilated environment for 24 hours after application.
- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing sealing compounds.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management.

.2 Divert metal cut-offs from landfill by disposal into on-site Metal recycling bin.

.3 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.

.4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.

.5 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.6 Remove form site and dispose of packaging materials at appropriate recycling facilities.

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

Part 2 Products

2.1 MATERIALS

.1 Tempered or Laminated Safety Glass **(GL-1**): to CAN/CGSB-12.1-M90 type 1, class B of 6mm thickness.
- .1 All non rated interior doors and framing assemblies to be laminated glazing to suit installation in acoustic doors and frames.

.2 Dual pane **(GL-2)**: Interior Screen S1
- .1 To CAN/CGSB-12.8-M97, Sealed unit dual glazed, total thickness 25mm.
  - .1 Outer pane: 6mm laminated glass
  - .2 Inner pane: 6mm laminated glass
  - .3 13mm air spaces, air filled.

2.2 ACCESSORIES

.1 Sealant: to Section 07 92 10 - Joint Sealing.

2.3 GLAZING AND SEALING COMPOUND MATERIALS

.1 Glazing compound: oil base, to CAN/CGSB-19.6-M87 type 1, black colour.

.2 Sealant compound: one component acrylic base, to CGSB 19-GP-5M, gun grade, colour selected by Architect.

.3 Glazing tape: preformed butyl tape, 10-15 durometer hardness, paper release, black colour.

.4 Setting blocks: neoprene, Shore "A" durometer hardness 80-90, 100 mm long x 6 mm high x width to suit glass thickness.

.5 Spacer shims: neoprene, Shore "A" durometer hardness 80-90, 75 mm long x 2.4 mm thick x 9 mm high.

.6 Poly shim tape: preformed butyl tape with integral foam rod.

.7 Urethane adhesive: formulated for installation of automobile windshields.

.8 Primer-sealers and cleaners: to glass manufacturer's standard.

Part 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 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, and ready to receive glazing.

3.3 INSTALLATION: INTERIOR DRY METHOD (TAPE AND TAPE)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.3 Place setting blocks at 1/4 with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape with sufficient pressure to attain full contact at perimeter of light or glass unit.

.5 Place glazing tape on free perimeter of glazing in same manner described in 3.4.3. Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.

.6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.7 Knife trim protruding tape.

3.4 SAFETY GLASS REQUIREMENTS

.1 Laminated Safety Glass:
  .1 Install at all interior doors and screens as to meet the STC ratings as identified.

3.5 FINISHING

.1 Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed.

3.6 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacture's instructions.

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

3.7 PROTECTION OF FINISHED WORK

.1 After installation, mark light with an "X" by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

.2 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 06 10 10 - Rough Carpentry

.2 Section 07 26 00 - Vapour Retarders

.3 Section 09 22 16 - Non-Structural Metal Framing

.4 Section 09 91 10 - Painting

1.3 REFERENCES

.1 Aluminum Association
- .1 AA DAF 45-[03(R2009)], Designation System for Aluminum Finishes.-1997.

.2 American Society for Testing and Materials International, (ASTM)
- .1 ASTM C475-[02(2007)], Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .2 ASTM C514-[04(2009e1)], Standard Specification for Nails for the Application of Gypsum Board.
- .3 ASTM C557-[03(2009)e1], Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- .4 ASTM C840-[08], Standard Specification for Application and Finishing of Gypsum Board.
- .5 ASTM C954-[07], Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
- .6 ASTM C1002-[07], Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .7 ASTM C1047-[09], Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .8 ASTM C1280-[99], Standard Specification for Application of Gypsum Sheathing.
- .9 ASTM C1177/C1177M-[08], Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .10 ASTM C1178/C1178M-[08], Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .11 ASTM C1396/C1396M-[09a], Standard Specification for Gypsum Wallboard.

.3 Association of the Wall and Ceilings Industries International (AWEI)
- .1 AWCI Levels of Gypsum Board Finish-[97].

.4 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .2 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[07], Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store gypsum board assemblies materials level indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
- .3 Protect from weather, elements and damage from construction operations.
- .4 Handle gypsum boards to prevent damage to edges, ends or surfaces.
- .5 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
- .6 Replace defective or damaged materials with new.

1.5 SITE ENVIRONMENTAL REQUIREMENTS

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

.2 Apply board and joint treatment to dry, frost free surfaces.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Consultant.

.5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.6 Divert unused wood materials from landfill to composting facility approved by Consultant.

.7 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Consultant.

.8 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Acceptable Materials:
- .1 Georgia Pacific
- .2 CGC
- .3 BPB Westroc
- .4 Certainteed

.2 Standard board: to ASTM C1396/C1396M, regular, 12.7 and 15.9 mm thick, Type X, 15.9 mm thick, and 25mm thick used as liner board in shaftwall assemblies, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.

.3 Glass mat water-resistant gypsum backing board: to ASTM C1178/C1178M, 15.9 mm thick, 1200 mm wide x maximum practical length.

.4 Drywall Suspension System:
- .1 USG Drywall Suspension System DGW/DGLW
  - .1 ASTM Heavy Duty, Class A for Fire Rated assemblies.
  - .2 Cross Channels, L and C moldings as required.

.5 Metal furring runners, hangers, tie wires, inserts, anchors.

.6 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.7 Resilient clips and drywall furring : 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.

.8 Nails: to ASTM C514.

.9 Steel drill screws: to ASTM C1002.

.10 Stud adhesive: to CAN/CGSB-71.25 ASTM C557.

.11 Laminating compound: as recommended by manufacturer, asbestos-free.

.12 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.

.13 Sealants: in accordance with Section 07 92 10 - Joint Sealing.

.14 Polyethylene: to CAN/CGSB-51.34, Type 2.

.15 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

.16 Joint compound: to ASTM C475, asbestos-free.

2.2 FIRESTOPPING

.1 Supply firestopping materials for complete installation of approved fire stop system in accordance with Section 07 84 00 - Firestopping.

Part 3 Execution

3.1 ERECTION

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Do application of gypsum sheathing in accordance with ASTM C1280.

.3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

.4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.5 Install work level to tolerance of 1:1200.

.6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles and as indicated.

.7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.

.8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.

.9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.10 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.

.11 Furr openings and around built-in equipment, cabinets, access panels and as indicated on four sides. Extend furring into reveals. Check clearances with equipment suppliers.

.12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

.13 Erect drywall resilient furring transversely across studs spaced maximum 400 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with25 mm drywall screw.

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

3.2 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Apply gypsum board to wood or metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.

.2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.

.2 Double-Layer Application:

.1 Install gypsum board for base layer and exposed gypsum board for face layer.

.2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.

.3 Apply base layers at right angles to supports unless otherwise indicated.

.4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

.3 Apply single layer gypsum board to concrete or concrete block surfaces, where indicated, using laminating adhesive.

.1 Comply with gypsum board manufacturer's recommendations.

.2 Brace or fasten gypsum board until fastening adhesive has set.

.3 Mechanically fasten gypsum board at top and bottom of each sheet.

.4 Exterior Soffits and Ceilings: Install exterior gypsum board perpendicular to supports; stagger end joints over supports. Install with 6 mm gap where boards abut other work.

.5 Apply water-resistant gypsum board adjacent to slop sinks janitors closets and other wet areas with painted drywall surfaces. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads.

.6 Apply Glass-mat water-resistant gypsum board behind all areas to receive tile finish and interior painted walls of pool area.. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads

.7 Install liner boards in shaftwall studs where indicated.

.8 Apply Glass-mat exterior gypsum sheathing on exterior vertical surfaces behind exterior finishes as indicated.

.9 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.

.10 Install single layer ceiling boards and exposed layer of double layer ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

.11 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.

.12 Install gypsum board with face side out.

.13 Do not install damaged or damp boards.

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

.15 Apply Stipple Ceiling in accordance with manufacturers written instructions by roller or spray and brush finish. Painting by Section 09 91 10 - Painting.

3.3 INSTALLATION

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre using contact adhesive for full length.

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.

.5 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.

.6 Provide continuous polyethylene dust barrier behind and across control joints.

.7 Locate control joints at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.

.8 Install control joints straight and true.

.9 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.

.10 Install expansion joint straight and true.

.11 Splice corners and intersections together and secure to each member with 3 screws.

.12 Install access doors to electrical and mechanical fixtures specified in respective sections.
.1 Rigidly secure frames to furring or framing systems.

.13 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.14 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.15 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.16 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

.17 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.18 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.19 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

.20 Mix joint compound slightly thinner than for joint taping.

.21 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.22 Allow skim coat to dry completely.

.23 Remove ridges by light sanding or wiping with damp cloth.

.24 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

3.4 FIRESTOPPING

.1 Install firestopping materials in accordance with cUL/ULC approved fire stop systems and systems manufacturers written instructions at all gypsum board partition terminations and non-mechanical and electrical penetrations of gypsum board partitions.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 06 10 10 - Rough Carpentry

.2 Section 07 26 00 - Vapour Retarders

.3 Section 09 21 16 - Gypsum Board Assemblies.

.4 Section 09 91 00 - Painting

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).
- .1 ASTM C645-00, Specification for Nonstructural Steel Framing Members.
- .2 ASTM C754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.

.3 Environmental Choice Program (ECP).
- .1 CCD-047a -98, Paints - Surface Coatings.
- .2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.5 Divert unused gypsum materials from landfill to recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C645, stud size as indicated, roll formed from 0.53mm (25ga) and 0.91mm (20ga) thickness as indicated and as required to suit span, hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460mm centres. For bulkhead construction use 0.53mm (25ga) thickness or as required to suit span.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 0.91 (20ga) thickness, 32mm flange height.

.3 Long leg top track: to ASTM C645, in widths to suit stud sizes, 51mm flange height, 0.91 (20ga) thickness with slots to allow for deflection connections to studs.

.4 Shaftwall (C-T or C-H) track: to ASTM C645, stud size as indicated, from 0.91mm thick, hot dipped galvanized steel sheet for attachment of gypsum liner and X-rated board.

.5 Metal channel stiffener: 38 x 13 x 1.21mm thick (18ga) cold rolled steel, coated with rust inhibitive coating. Metal channel stiffeners to be provided on all non-load bearing stud walls as follows:
- .1 Up to 3050mm high partition - 1 row mid span.
- .2 Over 3050mm high partition - 1525mm o.c. max.

.6 Acoustical sealant: to Section 07 92 10 - Joint Sealing.

.7 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required. Type 1650, roll stock.
- .1 Acceptable Manufacturer: Jacobs & Thompson Inc, Weston, Ontario.

.8 Aluminum Mouldings:
- .1 Fry Reglet Architectural Metals, W-moulding, WRM-75-75, Anodized Aluminum finish.
- .2 Fry Reglet Architectural Metals, Acoustical moulding, FDA-625, Anodized Aluminum finish. (Wood ceiling/gypsum board bulkhead).
- .3 Fry Reglet Architectural Metals, Acoustical moulding, FDA-75, Anodized Aluminum finish. (Acoustic ceiling/wood bulkhead).-75-75.

Part 3 Execution

3.1 ERECTION

.1 Align partition tracks at floor and ceiling and secure at 600mm on centre maximum.

.2 Install Long Leg Top Track where partition extends to underside of floor or roof structure and as indicated with a nested top track.

.3 Install strip insulation under stud shoe tracks of partitions on slabs on grade.

.4 Place studs vertically at 400 mm on centre and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.5 Erect metal studding to tolerance of 1:1000.

.6 Attach studs to bottom and ceiling track using screws.

.7 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.

.9 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50mm apart using column clips or other

approved means of fastening placed alongside frame anchor clips. Alternatively, install heavy gauge single jamb studs at openings.

.10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.

.12 Provide 40mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

.13 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.14 Extend partitions to ceiling height except where noted otherwise on drawings.

.15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50mm leg ceiling tracks. Use double track slip joint as indicated.

.16 Frame around structural components to maintain sound and fire rated assemblies.

.17 Extend sound and fire rated assemblies to underside of floor or roof deck unless otherwise indicated. Seal perimeter joints with acoustical caulking of approved fire stop system.

.18 Install continuous insulating strips to isolate studs from uninsulated surfaces.

.19 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

3.2 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 07 21 16 - Blanket Insulation

.2 Section 09 21 16 - Gypsum Board Assemblies.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM C423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
- .2 ASTM C635-00, Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
- .3 ASTM C636-96, Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- .4 ASTM E1264-98, Standard Classification for Acoustical Ceiling Products.
- .5 ASTM E1477-98a(2003), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA International)
- .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.5 Underwriter's Laboratories of Canada (ULC)
- .1 CAN/ULC-S102-2003, Surface Burning Characteristics of Building Materials and Assemblies.

1.4 DESIGN REQUIREMENTS

.1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.

1.5 QUALITY ASSURANCE

.1 Installer Qualifications: The installer must be a firm with a minimum of two (2) years of successful experience in installation of suspended wood ceilings of similar requirements to this project. The installer must be acceptable to the architect, manufacturer, and owner's representative.

.2 Fire Performance Characteristics: When specified as "Fire Resistant", wood ceiling boards shall conform to Class 1, or A flame spread rating, when tested according to ASTM E-84.

.3 Environmental Standards: When required the wood ceiling shall originate from well managed forests as certified by accredited and recognized industry certifying organizations.

1.6 PROJECT CONDITIONS

.1 Installation shall be done only when the temperature and humidity closely approximate the interior conditions that will exist when the building is occupied. The heating and cooling systems shall be operating before, during, and after installation, with the humidity of the interior spaces maintained between 25% and 55%.

.2 It is important that plenums have proper ventilation, especially in high moisture areas. There shall be no excessive build up of heat in the ceiling areas.

.3 Prior to the start of installation, all exterior windows and doors are to be in place, glazed, and weather-stripped. The roof is to be watertight, and all wet trades' work is to be completed, and thoroughly dry.

.4 Mechanical, electrical, and other utility service installations above the ceiling plane shall have been completed. No materials should rest against, or wrap around, the ceiling suspension components or connecting hangers.

1.7 COORDINATION OF WORK

.1 Layout and installation of the Linear and Acoustic Ceilings and their suspension systems shall be coordinated with other work penetrating through the ceiling. This includes light fixtures, HVAC equipment, and fire suppression system components.

1.8 SUBMITTALS

.1 Shop Drawings:
- .1 Submit shop drawings showing the placement of hangers, the location of cliprails, and other details deemed pertinent to proper installation.

.2 Samples:
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate quarter size samples of each type of acoustical units.
- .3 Submit a 228mm wide x 305mm long wood sample shall be submitted for approval. The sample shall be made of the wood specie selected, with the selected finish applied; and installed on cliprails.

1.9 REGULATORY REQUIREMENTS

.1 Health and Safety:
- .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.10 DELIVERY, STORAGE AND HANDLING

.1 Store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Protect on site stored or installed absorptive material from moisture damage.

.3 Store extra materials required for maintenance, where directed by Consultant.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.3 Remove from site and dispose of packaging materials at appropriate recycling facilities.

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

1.12 EXTRA MATERIALS

.1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide acoustical units amounting to 2% of gross ceiling area for each pattern and type required for project.

.3 Ensure extra materials are from same production run as installed materials.

.4 Clearly identify each type of acoustic unit, including colour and texture.

.5 Deliver to Owner, upon completion of the work of this section.

1.13 WARRANTY

.1 Grid System:
- .1 Submit a written warranty executed by the manufacturer, agreeing to repair or replace grid system that fails within the warranty period. Failures include but are not limited to :
  - .1 rusting and manufacturers defects.
- .2 Warranty period for grid system but for 10 years from date of substantial completion.

.2 Manufacturer: All materials supplied by the ceiling manufacturer shall be guaranteed against manufacturing defects for one (1) year. Because of differing site conditions, wood stains and colourings can vary with age, and are excluded from this warranty.

.3 Contractor: All work shall be guaranteed for one (1) year from final acceptance of completed work.

Part 2 Products

2.1 MATERIALS

.1 Intermediate duty system to ASTM C635-95.

.2 Basic materials for suspension system: commercial quality cold rolled steel, zinc coated.

.3 Exposed tee bar grid components: shop painted satin sheen white. Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.

.4 Hanger wire: galvanized soft annealed steel wire.
- .1 3.6 mm diameter for access tile ceilings.
- .2 to ULC design requirements for fire rated assemblies.

.3 2.6 mm diameter for other ceilings.

.5 Hanger inserts: purpose made.

.6 Carrying channels: as recommended by manufacturer.

.7 Accessories: splices, clips, wire ties, retainers and wall moulding flush reveal, to complement suspension system components, as recommended by system manufacturer.

.8 Acceptable Materials:
.1 Exposed Tee System: Two directional, 610mm x 1220mm x 15/16"; steel, electro-galvanized.
.1 Armstrong, Prelude.
.2 Finish: White.

2.2 ACCEPTABLE PRODUCTS

.1 Acoustic Ceiling Tile (ACT 1): 609.6 x 1219.2x 44mm (24" x 48" x 1 3\4") thick, Square Lay-in, white, mineral tile, fine texture pattern, NRC .95, CAC 44, AC 200, Fire Resistance: Class A, Light Reflectance 0.88;
.1 Basis of Design:
.1 Armstrong: 8752PB (High CAC with Plant-based Binder) or approved equal.

Part 3 Execution

3.1 INSTALLATION

.1 Installation: in accordance with ASTM C636 except where specified otherwise.

.2 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.

.3 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.

.4 Secure hangers to overhead structure using attachment methods acceptable to Consultant.

.5 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.

.6 Lay out system according to reflected ceiling plan.

.7 Ensure suspension system is co-ordinated with location of related components.

.8 Install wall moulding to provide correct ceiling height.

.9 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.

.10 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.11 Interlock cross member to main runner to provide rigid assembly.

.12 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

.13 Install access splines to provide 25 percent ceiling access.

.14 Finished ceiling system to be square with adjoining walls and level within 1:1000.

.15 Expansion joints.

.1 Erect two main runners parallel, 25 mm apart, on building expansion joint line. Lay in strip of acoustic tile/board, painted black, 25% narrower than space between 2 'T' bars.

3.2 ACOUSTIC TILE EXAMINATION

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

3.3 INSTALLATION

.1 Install acoustical panels and tiles in ceiling suspension system in accordance with manufacturers written instructions

.2 In fire rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

3.4 INTERFACE WITH OTHER WORK

.1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

3.5 SCHEDULE

.1 Refer to Room Finish Schedule for locations of ceiling types and layout.

3.6 CLEANING

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

.2 Contractor shall make final adjustments to level or contours.

.3 Upon completion of ceiling installation, all Linear Wood Strips and borders shall be cleaned free of dirt, dust, grease, oils, and fingerprints.

.4 All work that cannot be successfully cleaned or repaired, shall be removed and replaced.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 03 30 05 - Cast-In-Place Concrete

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM International)
  .1 ASTM F1303-99, Specification for Sheet Vinyl Floor Covering with Backing.

.2 Canadian Standards Association (CSA International)
  .1 CAN/CSA-ISO 14040-97, Environmental Management - Life Cycle Assessment - Principles and Framework (Adopted ISO 14040:1997, first edition).

1.4 SUBMITTALS

.1 Samples
  .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  .2 Submit three (3) 300 x 300 mm sample pieces of sheet material, 300 mm long base, nosing, feature strips, treads, edge strips.

.2 Seaming Diagram:
  .1 Provide a Seaming Diagram for all sheet flooring indicated on drawings.

1.5 CLOSEOUT SUBMITTALS

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

1.6 EXTRA MATERIALS

.1 Provide extra materials of resilient flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 10m^2 of each colour, pattern and type flooring material required for project for maintenance use.

.3 Extra materials to be in one piece and from same production run as installed materials.

.4 Clearly identify each roll of sheet flooring and each container of adhesive.

.5 Deliver to Consultant, upon completion of the work of this section.

.6 Store where directed by Consultant.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Maintain air temperature and structural base temperature at flooring installation area above 20^o for 48 hours before, during and 48 hours after installation.

.2 Relative Humidity test results for sub-floor must not exceed 80%. If the tests results exceed the limitations, the installation must not proceed until the problem has been corrected.

1.8 MOCK-UP

.1 Provide mock-up of one complete Room for Consultant review

.2 Mock-up to include typical sheet weld joints and joint location for consultant approval.

.3 Once approved, all work is to be installed in a similar manor as determined by the Consultant.

.4 Approved mock-up can remain as part of the Work.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management And Disposal.

.2 Do not dispose of unused sealant and adhesive materials into landfill. Divert materials to municipal hazardous materials depot approved by Consultant.

.3 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Consultant.

.4 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.5 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

Part 2 Products

2.1 MATERIALS

.1 Luxury Vinyl Tile (LVT):

.1	Product Number:	A002
.2	Colour:	A00203 Chestnut
.3	Product Construction:	High Performance Luxury Vinyl Tile
.4	Class / ASTM F1700:	Class III Printed Vinyl Plank
.5	Wear Layer Thickness:	22 mil
.6	Total Thickness:	4.5 mm
.7	Backing Class:	Commercial Grade
.8	Finish:	Ceramor® Coating
.9	Nominal Dimensions:	25cm x 1m (9.845 in x 39.38 in)
.10	Install:	Floating Floor with TacTiles® Glue-Free Installation System, Herringbone pattern at 45 deg. to walls.

.2 Linoleum Sheet Flooring (LIN1), and Linoleum Adhesive.

.1 Homogeneous sheet linoleum of primarily natural materials consisting of linseed oil, wood flour, and rosin binders, mixed and calendered onto natural jute backing. Pattern and colour shall extend throughout total thickness of material.

.2 Width: 2 Meters

.3 Length: 32 Meters

.4 Gauge: 2.5mm

.5 Backing: Jute
.6 Static Load Limit: 850psi.
.7 Impact Sound Reduction: 6dB.
.8 Suitable for office chairs and castors,
.9 Pattern and Colour: Up to 4 colours,
.10 Adhesive: as recommended by manufacturer.
.11 Heat Welding Rod: colour matched, marbleized multi-colour welding rod.
.12 Topshield2 finish (water based), 97% raw materials.
.13 Acceptable Materials:
.1 Marmoleum Real (two colours/patterns).
.2 Colour to be determined by Consultant from full colour range.

.3 Resilient base:
.1 (RB1) Johnsonite, Traditional DC Wall Base, PVC Free, or approved equal.
.1 Thickness: 3.17mm
.2 Height: 102mm Toed (coved),
.3 Colour: Refer to Finish Schedule.
.2 Base adhesive: 945 Premium Contact Adhesive (non-porous surfaces) or 960 Wall Base Adhesive (porous surfaces) approved equal.

.4 Transition Strips:
.1 (TS-1): CPT to LVT: Johnsonite, Slim Line Transitions, SLTC-XX-A,
.2 For Transition Colours, refer to Finish Schedule.

.5 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.

.6 External corner protectors: stainless steel, type recommended by flooring manufacturer.

.7 Edging to floor penetrations: aluminum, type recommended by flooring manufacturer.

.8 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

.1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

.2 Proceeding with Work indicates acceptance of substrate within area of Work.

.3 Defects identified to be rectified by responsible trade prior to proceeding with Work.

3.2 PREPARATION

.1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.3 Old vinyl flooring to be removed by trained personnel (may contain asbestos).

.4 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.

.5 Prime Seal concrete slab plywood sub-floor to resilient flooring manufacturer's printed instructions.

3.3 APPLICATION: SHEET FLOORING

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

.2 To minimize emissions from adhesives, use water-based, solvent-free styrene-butadiene-rubber adhesive for linoleum. Butadiene exposure may cause eye and nose irritation, headaches, dizziness, and vomiting.

.3 Apply low VOC water based adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.4 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.

.5 Run sheets in direction of traffic. Double cut sheet joints and heat weld according to manufacturer's printed instructions.

.6 Heat weld seams of sheet flooring in accordance with manufacturer's printed instructions.

.7 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.

.8 Cut flooring neatly around fixed objects.

.9 Install feature strips and floor markings where indicated. Fit joints tightly.

.10 Install flooring in pan type floor access covers. Maintain floor pattern.

.11 Install sheet flooring in all elevators as indicated

.12 Continue flooring over areas which will be under built-in furniture.

.13 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

.14 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

.15 Install transition strips at unprotected or exposed edges where flooring terminates.

3.4 APPLICATION: BASE

.1 Roll out base and acclimatise for 24 hours prior to installation.

.2 Lay out base to keep number of joints at minimum.

.3 Clean substrate and ensure it is smooth and level.

.4 Dry fit cut base to ensure proper fit.

.5 Apply adhesive to back of base and spread out with a base trowel to 6mm below top edge..

.6 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

.7 Install straight and level to variation of 1:1000.

.8 Scribe and fit to door frames and other obstructions.

.9 (RB2) Scribe corner location on base and cut back of base to allow wrap around inside and outside corners. Roll base with hand roller into corners.

.10 Use coved type resilient unless other wise noted

3.5 CLEANING

.1 Remove excess adhesive from floor, base and wall surfaces without damage.

.2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.6 PROTECTION

.1 Protect new floors from time of final set of adhesive until final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

.3 Use only water-based coating for linoleum.

3.7 SCHEDULES

.1 Refer to Room Finish Schedule for Flooring style and locations.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 03 30 05 - Cast-In-Place Concrete.

1.3 REFERENCES

.1 American Association of Textile Chemists and Colorists (AATCC)
- .1 AATCC 16-1998, Color Fastness to Light.
- .2 AATCC 23-1999, Color Fastness to Burn Gas Fumes.
- .3 AATCC 118-1997, Oil Repellency: Hydrocarbon Resistance Test.
- .4 AATCC 129-2001, Colour Fastness to Ozone in the Atmosphere Under High Humidities.
- .5 AATCC 134-2001, Electrostatic Propensity of Carpet.
- .6 AATCC 171-2000, Carpets: Cleaning of; Hot Water Extraction Method.
- .7 AATCC 174-1998, Antimicrobial Activity Assessment of Carpets.
- .8 AATCC 175-1998, Stain Resistance: Pile Floor Coverings.
- .9 AATCC 189-2001, Fluorine Content of Carpet Fibers.

.2 American Society for Testing and Materials (ASTM International)
- .1 ASTM D1055-97, Specification for Flexible Cellular Materials - Latex Foam.
- .2 ASTM D1335-98, Tuft Bind of Pile Floor Coverings.
- .3 ASTM D1667-97, Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
- .4 ASTM D3936-00 Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
- .5 ASTM D5252-98a, Standard Practice for the Operation of the Hexapod Drum Tester.
- .6 ASTM D5417-99, Standard Practice for Operation of the Vettermann Drum Tester.
- .7 ASTM E84-01, Test Method for Surface Burning Characteristics of Building Materials.
- .8 ASTM E648-00, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- .9 ASTM E662-01, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-4.2 No.27.6-M91, Textile Test Methods - Flame Resistance - Methemine Tablet Test for Textile Floor Coverings.
- .2 CAN/CGSB-4.2 No.77.1-94/ISO 4919:1978, Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.
- .3 CAN/CGSB-4.129-93(R1997), Carpets for Commercial Use.
- .4 CGSB 20-GP-23M-78, Cushion, Carpet, Flexible Polymeric Material.
- .5 CAN/CGSB-25.20-95, Surface Sealer Floors.

.4 Carpet and Rug Institute (CRI)
- .1 CRI-104-96, Standard Installation of Commercial Carpet.
- .2 IAQ Carpet Testing Program.

.5 National Floor Covering Association (NFCA)
.1 Floor Covering Specification Manual 1998.

.6 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC-S102-88(R2000), Surface Burning Characteristics of Building Materials and Assemblies.
.2 CAN/ULC-S102.2-88(R2000), Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

1.4 SUBMITTALS

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

.2 Submit verification to demonstrate compliance with CAN/ULCS102 and CAN/ULCS102.2.

.3 Submit proof that carpet has been tested and passed the Indoor Air Quality (IAQ) Carpet Testing Program requirements of the Carpet and Rug Institute (CRI) and the Canadian Carpet Institute (CCI).

.4 Submit report verifying that tuft bind meets requirements of CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No.77.1.

.5 Submit report outlining proposed dust control measures.

.6 Submit carpet schedule using same room designations indicated on drawings.

.7 Submit carpet manufacturer's installation instructions: Indicate special procedures and perimeter conditions requiring special attention.

.8 Submit certification and description of carpet reclamation recycling process.

1.5 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit product data sheet for each carpet, undercushion, adhesive, carpet protection and subfloor patching compound.

.3 Submit WHMIS MSDS - Material Safety Data Sheets acceptable to Labour Canada and Health Canada for carpet adhesive and seam adhesive. Indicate VOC content.

.4 Submit data on specified products, describing physical and performance characteristics, sizes, patterns, colours, and methods of installation.

1.6 SAMPLES

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

.2 Submit duplicate 675 x 900 mm pieces of each type carpet specified, duplicate 225 x 225 mm pieces for each colour selected, 300 mm square pieces of undercushion, 150 mm lengths of carpet gripper and binder bars base divider strips.

1.7 CLOSEOUT SUBMITTALS

.1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Submit maintenance data: Include maintenance procedures, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.

1.8 QUALIFICATIONS

.1 Installer Qualifications:
  .1 Flooring contractor requirements.
    .1 Specialty contractor normally engaged in this type of work, with prior experience in installation of these types of materials.
    .2 Certified by carpet manufacturer prior to tender bid submission.
    .3 Must not sub-contract labour without written approval of Consultant.

.2 Be responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturers written instructions.

1.9 REGULATORY REQUIREMENTS

.1 Prequalification: compliance with Department of Consumers and Corporate Affairs regulations under "Hazardous Products Act", Part II of the Schedule, tested to CAN/CGSB-4.2-No.27.6.

.2 Indoor Air Quality: compliance with CRI/CCI Green Label Indoor Air Quality Program, CRI/CCI-IAQ requirements for maximum total volatile chemicals released into air. Label each carpet product with CRI/CCI-IAQ label.

1.10 DELIVERY, STORAGE AND HANDLING

.1 Store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Store packaged materials in original containers or wrapping with manufacturer's seals and labels intact.

.3 Store carpeting and accessories in location as directed by Engineer Consultant. Store carpet and adhesive at minimum temperature of 18°C and relative humidity of maximum 65% for minimum of 48 hours before installation.

.4 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

.5 Store materials in area of installation for minimum period of 48 hours prior to installation.

.6 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with Waste Reduction Workplan.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

1.12 ENVIRONMENTAL REQUIREMENTS

.1 Moisture: Ensure substrate is within moisture limits and alkalinity limits prescribed by manufacturer. Prepare moisture testing and provide report to Engineer Consultant.

.2 Temperature: Maintain ambient temperature of not less than 18 °C from 48 hours before installation to at least 48 hours after completion of work.

.3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 48 hours before, during and 48 hours after installation.

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

.5 Ventilation:
- .1 Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.
- .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities. Provide fans with HEPA filters.
- .3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.

.6 Test existing floor levelling compound for presence of asbestos contamination. Notify Consultant for additional instructions where asbestos is discovered.

.7 Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

1.13 EXTRA MATERIALS

.1 Provide extra materials of carpet, carpet base, and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 2% of each colour, pattern and type of carpeting. Provide in one continuous full width roll.

.3 Extra materials to be from same production run as installed materials.

.4 Identify each package of carpet and each container of adhesive.

.5 Deliver to Owner and store where directed.

Part 2 Products

2.1 MANUFACTURERS

.1 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute IAQ requirements.

2.2 MATERIALS

.1 Provide products/materials with a minimum 40% post-consumer recycled content by percent mass.

.2 Provide carpet systems including carpet, cushion, and adhesives that meet or exceed the requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Testing Program.

2.3 CARPET

.1 Carpet (CPT1):

.1	Manufacturer:	Interface Progression III Colorline
.2	Modular, 25cm x 1m:	147240AK00
.3	Backing System:	GlasBac® Tile
.4	Yarn Manufacturer:	Universal
.5	Yarn System:	Post-Consumer Content Type 6,6 Nylon
.6	Color System:	100% Solution Dyed
.7	Construction:	Tufted Textured Loop
.8	Lifetime Antimicrobial:	Intersept®
.9	Soil/Stain Protection:	Protekt2®
.10	Pile Thickness:	0.104 in 2.6 mm
.11	Pile Density:	6,577
.12	Total Recycled Content:	68%
.13	Indoor Air Quality:	CRI Green Label Plus #GLP0820

.2 Random Layout

.1 Up to three (3) colours combined randomly in herringbone pattern, 45 deg. to wall.

2.4 ACCESSORIES

.1 Resilient Bases: in accordance with Section 09 65 16 - Resilient Flooring

.2 Carpet Tile Adhesive:

.1 Tac Tile Pressure Sensitive Carpet Tile Adhesive Squares.

.3 Carpet protection: non-staining heavy duty kraft paper.

.4 Concrete floor sealer: to CAN/CGSB-25.20, Type 1.

.5 Subfloor patching compound: Portland cement base filler, mix with latex and water to form a cementitious paste.

Part 3 Execution

3.1 SUB-FLOOR TREATMENT

.1 Concrete shall be inspected to determine special care required to make it a suitable foundation for carpet. Cracks 3 mm wide or protrusions over 0.8 mm will be filled and levelled with appropriate and compatible latex or polymer fortified patching compound.

.2 Do not exceed manufacturer's recommendations for patch thickness.

.3 Large patch areas are to primed with a compatible primer.

.4 Concrete substrates shall be cured, clean and dry.

.5 Concrete substrates shall be free of paint, dirt, grease, oil, curing or parting agents, and other contaminates, including sealers, that may interfere with the bonding of the adhesive.

.6 Wherever a powdery or porous concrete surface is encountered, a primer compatible with the adhesive shall be used to provide a suitable surface for glue-down installation.

3.2 PREPARATION

.1 The base should be firm and dry and floors should be cleared of all debris.

.2 All traces of old floorcoverings and adhesive residues must be removed and, if necessary, the surface treated with a floor smoothing underlayment compatible with the flooring to suit local site conditions in accordance with manufacturers recommendations. Any necessary preparation should be carried out in good time, to allow for setting and drying of any smoothing underlayment.

.3 Prepare floor surfaces in accordance with CRI 104 Standard for Installation of Commercial Carpet.

.4 Pre-condition carpeting following manufacturer's printed instructions.

3.3 INSTALLATION

.1 Install carpeting using minimum of pieces.

.2 Install in accordance with manufacturer's printed instructions and in accordance with Carpet and Rug Institute Standard for Installation of Commercial Carpet, CRI 104.

.3 Install carpet after finishing work is completed.

.4 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.

.5 Use material from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain constant pile direction.

.6 Adhesive seams and cross-joints. Seam edges must be sealed.

.7 Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.

.8 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

.9 Install carpet smooth and free of bubbles, puckers, and other defects.

3.4 TILE CARPET

.1 Lay anchor rows, placing a TacTile connector at every joint. Install carpet using a step method placing a TacTile connector at every corner.

.2 Insert tiles based on approved installation method. TacTiles.

3.5 SEAMS

.1 Seal edges of cut-outs with latex.

.2 Carpet visibility of seams and joints to acceptable industry standards.

3.6 RESILIENT BASE APPLICATION

.1 Lay out base to keep number of joints at minimum. Base joints at maximum length available or at internal or premoulded corners.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

.5 Install straight and level to variation of 1:1000.

.6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

.7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles, minimum 300 mm each leg.

3.7 PROTECTION OF FINISHED WORK

.1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.

.2 Prohibit traffic on carpet for a period of 24 hours until adhesive is cured.

.3 Install carpet protection to satisfaction of Consultant.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

.1 Section Includes: All labour, materials, tools and other equipment, services and supervision required to complete all exterior and interior painting and decorating work as indicated on Finish Schedules and to the full extent of the drawings and specifications.

.2 The Work shall also include, but not necessarily be limited to surface preparation of substrates as required for acceptance of painting, including cleaning, small crack repair, patching, caulking, making good surfaces and areas, pre-treatment, priming and back-priming to the extent / limits defined under MPI preparation requirements.

.3 Provide Unit, Separate and/or Alternative Prices for items indicated in Section 01 21 00 Alternatives and/or on Bid Form.

1.3 RELATED SECTIONS

.1 Section 08 11 14 - Steel Doors and Frames.

.2 Section 09 21 16 - Gypsum Board Assemblies.

.3 Section 23 00 00 - Mechanical General Requirements.

1.4 REFERENCES

.1 MPI (Master Painters Institute) - Architectural Painting Specification Manual.

1.5 QUALITY ASSURANCE:

.1 This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall maintain a qualified crew of painters throughout the duration of the work.

.2 All materials, preparation and workmanship shall conform to requirements of the latest edition of the Architectural Painting Specification Manual by the Master Painters Institute (MPI) (hereafter referred to as the MPI Painting Manual) as issued by the local MPI Accredited Quality Assurance Association having jurisdiction.

.3 All paint manufacturers and products used shall be as listed under the Approved Product List section of the MPI Painting Manual.

.4 All surfaces requiring painting shall be inspected by the Contractor, who shall identify any defects or problems and take remedial action to correct said work prior to commencing painting work.

.5 The painting contractor shall receive written confirmation of the specific surface preparation procedures and primers used for all fabricated steel items from the fabricator / supplier to ascertain appropriate and manufacturer compatible finish coat materials to be used before painting any such work.

1.6 REGULATORY REQUIREMENTS

.1 Conform to work place safety regulations and requirements for those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.

1.7 SUBMITTALS

.1 Submit maintenance materials in accordance with Section 01 78 00 Closeout Submittals.

.2 Submit an invoice list of all painting materials ordered for project work to Consultant indicating manufacturer, types and quantities for verification and compliance with specification and design requirements.

.3 Submit two sets of Material Safety Data Sheets (MSDS) prior to commencement of work for review and for posting at job site as required.

.4 At project completion provide an itemized list complete with manufacturer, paint type and colour-coding for all colours used for Owner's later use in maintenance.

.5 Submit duplicate samples of paint Pull-downs for each paint selected by consultant.

1.8 EXTRA MATERIALS

.1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit one 4 litre can of each type and colour of primer and finish coating. Identify colour and paint type in relation to established colour schedule and finish formula. Deliver to Owner and store where indicated.

1.9 QUALITY CONTROL

.1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Prepare and paint a designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work. Mock-up may become part of the work.

1.10 DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver all painting materials in sealed, original labelled containers bearing manufacturer's name, brand name, type of paint or coating and colour designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.

.3 Store all paint materials in original labelled containers in a secure (lockable), dry, heated and well ventilated single designated area meeting the minimum requirements of both paint manufacturer and authorities having jurisdiction and at a minimum ambient temperature of (7° C). Only material used on this project to be stored on site.

.4 Where toxic and/or volatile / explosive / flammable materials are being used, provide adequate fireproof storage lockers and take all necessary precautions and post adequate warnings (e.g. no smoking) as required.

.5 Take all necessary precautionary and safety measures to prevent fire hazards and spontaneous combustion and to protect the environment from hazard spills. Materials that constitute a fire hazard (paints, solvents, drop clothes, etc.) shall be stored in suitable closed and rated containers and removed from the site on a daily basis.

.6 Store materials and supplies away from heat generating devices.

.7 Provide minimum one 9 kg Type ABC fire extinguisher adjacent to storage area.

.8 Fire Safety Requirements
- .1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling.
- .3 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with CEPA, and Regional and Municipal, regulations.
- .6 Ensure emptied containers are sealed and stored safely.
- .7 Unused paint and coating materials must be disposed of at official hazardous material collections site as approved by Consultant.
- .8 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .9 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .10 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .11 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
  - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
  - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
  - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
  - .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
  - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .12 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .13 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by employees, individuals, or organizations for verifiable re-use or re-manufacturing.

1.12 ENVIRONMENTAL REQUIREMENTS

.1 Perform no painting or decorating work when the ambient air and substrate temperatures, relative humidity and dew point and substrate moisture content is below or above requirements for both interior and exterior work, as per manufacturer's written instructions.

.2 Apply paint only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

.3 Ensure adequate continuous ventilation and sufficient heating and lighting is in place.

.4 Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be regarded as hazardous products. Recycle and dispose of same as per Section 01 74 21 - Construction Waste Management And Disposal.

.5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground retain cleaning water and filter out and properly dispose of sediments.

.6 Set aside and protect surplus and uncontaminated finish materials not required by the Owner and deliver or arrange collection for reuse or recycling as per Section 01 74 21 - Construction Waste Management And Disposal

1.13 GUARANTEE

.1 Provide and pay for either the local MPI Accredited Quality Assurance Association's two (2) year guarantee, or, alternatively, a 100% two (2) year Maintenance Bond - both in accordance with MPI Painting Manual requirements. The Maintenance Bond shall warrant that all painting work has been performed in accordance with MPI Painting Manual requirements.

Part 2 Products

2.1 MATERIALS

.1 Use Paints and coatings that comply with VOC limits set out by respective standards as follows:
- .1 Architectural paints, coatings and primers for interior walls and ceilings shall not exceed the VOC content limits established in Green Seal Standard GS-11.
- .2 Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates shall not exceed the VOC content limit established in Green Seal Standard GS-11, Paints. (Note: GS-03 as referenced in LEED Reference Guide has been merged into GS-11 as of the January 1, 2010 release of GS-11 Third Edition.)
- .3 Clear wood finishes, floor coatings, stains, and shellacs applied to interior elements shall not exceed VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings.

.2 Only materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, etc.) listed in the latest edition of the MPI Approved Product List (APL) are acceptable for use on this project. All such material shall be from a single manufacturer for each system used.

.3 Other materials such as linseed oil, shellac, thinners, solvents, etc. shall be the highest quality product of an MPI listed manufacturer and shall be compatible with paint materials being used as required.

.4 Use only materials having a minimum MPI "Environmentally Friendly" E3 rating based on VOC (EPA Method 24) content levels. Indoor air quality (odour) is an issue, use only MPI listed materials having a minimum E3 rating.

2.2 MIXING AND TINTING

.1 Unless otherwise specified herein or pre-approved, all paint shall be 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. Where thinner is used, addition shall not exceed paint manufacturer's recommendations.

2.3 COLOUR

.1 Unless otherwise noted, all painting work shall be in accordance with MPI Premium Grade finish requirements.

.2 Colours shall be as selected by the Consultant from a manufacturer’s full range of colours. The schedule will be furnished after award of the Contract, except general requirements shall be as noted herein.

.3 No more than three (3) colours will be selected for the entire project and no more than three (3) colours will be selected in each area. Note that this does not include pre-finished items by others, e.g. flashings, windows, etc.

2.4 GLOSS AND SHEEN

.1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following MPI values:

Gloss Level	Description	Units @ 60 degrees	Units @ 86 degrees	Surfaces
G1	Matte or Flat Finish	0 to 5	10 max.	Ceiling and Bulkheads
G2	Velvet Finish	0 to 10	10 to 35	
G3	Eggshell Finish	10 to 25	10 to 35	General Walls
G4	Satin Finish	20 to 35	35 min.	
G5	Semi-Gloss Finish	35 to 70		HM doors and frames
G6	Gloss Finish	70 to 85		
G7	High Gloss Finish	> 85		

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

Part 3 Execution

3.1 CONDITION OF SURFACES

.1 Prior to commencement of work of this section, thoroughly examine (and test as required) all conditions and surfaces scheduled to be painted and report in writing to the Contractor and Consultant any conditions or surfaces that will adversely affect work of this section.

.2 No painting work shall commence until all such adverse conditions and defects have been corrected and surfaces and conditions are acceptable to the Painting Subcontractor.

.3 Commencement of work shall not be held to imply acceptance of surfaces except as qualified herein. Such surfaces as concrete, masonry, structural steel and miscellaneous metal, wood, gypsum board and plaster, shall not be the responsibility of the Painting Subcontractor.

.4 The Painting Subcontractor shall not be responsible for the condition of the substrate or for correcting defects and deficiencies in the substrate which may adversely affect the painting work except for minimal work normally performed by the Painting Subcontractor and as indicated herein. It shall always, however, be the responsibility of the Painting Subcontractor to see that surfaces are properly prepared before any paint or coating is applied.

3.2 PREPARATION OF SURFACES

.1 Prepare all surfaces in accordance with MPI requirements. Refer to the MPI Painting Manual in regard to specific requirements for the following:
- .1 environmental conditions.
- .2 pH testing.
- .3 acid etching.
- .4 rust stain removal.
- .5 vertical and horizontal concrete surfaces.
- .6 clay and concrete masonry units.
- .7 structural steel and miscellaneous metals.
- .8 steel exposed to high heat.
- .9 galvanized and zinc coated metal.
- .10 aluminum and copper surfaces.
- .11 glue laminated beams and columns.
- .12 dimension and dressed lumber.
- .13 wood doors.
- .14 wood panelling and casework.
- .15 wood decks, floors, stairs and steps.
- .16 wood shingles and shakes.
- .17 stucco, plaster and gypsum board.
- .18 acoustical panels and tiles.
- .19 canvas and cotton coverings.
- .20 bituminous coated surfaces.

.2 Sand, clean, dry, etch, neutralize and/or test all surfaces under adequate illumination, ventilation and temperature requirements.

.3 Remove and securely store all miscellaneous hardware and surface fittings / fastenings (e.g. electrical plates, mechanical louvers, door and window hardware (e.g. hinges, knobs, locks, trim, frame stops), removable rating / hazard / instruction labels, washroom accessories, light fixture trim, etc. from wall and ceiling surfaces, doors and frames, prior to painting. Carefully clean and replace all such items upon completion of painting work in each area. Do not use solvent or reactive cleaning agents on items that will mar or remove finishes (e.g. lacquer finishes). Doors shall be removed before painting to paint bottom and top edges and then re-hung.

.4 Protect all adjacent interior surfaces and areas, including rating and instruction labels on doors, frames, equipment, piping, etc., from painting operations and damage by drop cloths, shields, masking, templates, or other suitable protective means and make good any damage caused by failure to provide such protection.

.5 Substrate defects shall be made good and sanded by others ready for painting particularly after the first coat of paint. Start of finish painting of defective surfaces (e.g. gypsum board) shall indicate acceptance of substrate and any costs of making good defects shall be borne by the painter including re-painting of entire defective surface (no touch-up painting).

.6 Confirm preparation and primer used with fabricator of steel items. Refer to Quality Assurance.

3.3 APPLICATION

.1 Do not paint unless substrates are acceptable and/or until all environmental conditions (heating, ventilation, lighting and completion of other subtrade work) are acceptable for applications of products.

.2 Apply paint or stain in accordance with MPI Painting Manual Premium Grade finish requirements.

.3 Apply paint and decorating material in a workmanlike manner using skilled and trade qualified applicators as noted under Quality Assurance.

.4 Apply paint and coatings within an appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or the manufacturer's paint specifications require earlier applications.

.5 Painting coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer's recommendations.

.6 Tint each coat of paint progressively lighter to enable confirmation of number of coats.

.7 Unless otherwise approved by the painting inspection agency, apply a minimum of four coats of paint where deep or bright colours are used to achieve satisfactory results.

.8 Sand and dust between each coat to provide an anchor for next coat and to remove defects visible from a distance up to 1000 mm (39").

.9 Do not apply finishes on surfaces that are not sufficiently dry. Unless manufacturer's directions state otherwise, each coat shall be sufficiently dry and hard before a following coat is applied.

.10 Prime coat of stain or varnish finishes may be reduced in accordance with manufacturer's directions.

.11 Paint finish shall continue through behind all wall-mounted items (e.g. chalk and tack boards).

3.4 INTERIOR PAINT AND COATING SYSTEMS

.1 Paint interior surfaces in accordance with the following MPI Painting Manual requirements:

.2 Galvanized Metal: (doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etc.)
- .1 INT 5.3M Two coats HIPAC Latex over W.B Galvanized primer, G-5 gloss level.

.3 Plaster and Gypsum Board: (gypsum wallboard, drywall, "sheet rock type material", etc., and textured finishes)
- .1 INT 9.2A Two coats Latex over Latex primer/sealer, G-3 gloss level.(egg-shell)

.4 Canvas and Cotton Coverings:
- .1 INT 10.1D Two coats Institutional low odour / low VOC over Latex primer sealer G-1 gloss level.

3.5 FIRE SEPARATION LABELLING

.1 Fire Resistance Rating to be marked on all fire separations, both sides, max distance between 1220mm labels.

.2 Fire Resistance Rating to be indicated in red latex enamel paint with letters min25mm high

.3 Create stencil and submit for Consultant review.
- .1 Nomenclature to be used as appropriate:

.1 0 HOUR.
.2 45 MIN FRR.
.3 60 MIN FRR.
.4 90 MIN FRR

3.6 MECHANICAL / ELECTRICAL EQUIPMENT AND RELATED SURFACES

.1 Unless otherwise specified or noted, paint all “unfinished” conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and texture to match adjacent surfaces, in the following areas:
  .1 where exposed-to-view in all exterior and interior areas.
  .2 in all interior high humidity interior areas.
  .3 in all boiler room, mechanical and electrical rooms.

.2 In unfinished areas leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.3 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.4 Do not paint over nameplates.

.5 Paint the inside of all ductwork where visible behind louvers, grilles and diffusers for a minimum of 460 mm (18”) or beyond sight line, whichever is greater, with primer and one coat of matt black (non-reflecting) paint.

.6 Paint the inside of light valances gloss white.

.7 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.8 Paint red or band all fire protection piping and sprinkler lines in accordance with mechanical specification requirements. Keep sprinkler heads free of paint.

.9 Paint yellow or band all natural gas piping in accordance with mechanical specification requirements.

.10 Back prime and paint face and edges of plywood service panels for telephone and electrical equipment before installation gray, semi-gloss to match adjacent wall surface. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.11 Paint exterior steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.7 FIELD QUALITY CONTROL / STANDARD OF ACCEPTANCE

.1 All surfaces, preparation and paint applications shall be inspected.

.2 Painted exterior and interior surfaces shall be considered to lack uniformity and soundness if any of the following defects are apparent to the Consultant:
  .1 brush / roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
  .2 evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
  .3 damage due to touching before paint is sufficiently dry or any other contributory cause.
  .4 damage due to application on moist surfaces or caused by inadequate protection from the weather.
  .5 damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.).

.3 Painted surfaces shall be considered unacceptable if any of the following are evident under natural lighting source for exterior surfaces and final lighting source (including daylight) for interior surfaces:

.1 visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 1000 mm (39”).

.2 visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 1000 mm (39”).

.3 visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.

.4 when the final coat on any surface exhibits a lack of uniformity of colour, sheen, texture, and hiding across full surface area.

.4 Painted surfaces rejected by the inspector shall be made good at the expense of the Contractor. Small affected areas may be touched up; large affected areas or areas without sufficient dry film thickness of paint shall be repainted. Runs, sags of damaged paint shall be removed by scraper or by sanding prior to application of paint.

3.8 PROTECTION

.1 Protect all exterior surfaces and areas, including landscaping, walks, drives, all adjacent building surfaces (including glass, aluminum surfaces, etc.) and equipment and any labels and signage from painting operations and damage by drop cloths, shields, masking, templates, or other suitable protective means and make good any damage caused by failure to provide such protection.

.2 Protect all interior surfaces and areas, including glass, aluminum surfaces, etc. and equipment and any labels and signage from painting operations and damage by drop cloths, shields, masking, templates, or other suitable protective means and make good any damage caused by failure to provide such protection.

.3 Erect barriers or screens and post signs to warn of or limit or direct traffic away or around work area as required.

3.9 CLEAN-UP

.1 Remove all paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

.2 Keep work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

.3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.

.4 Clean equipment and dispose of wash water / solvents as well as all other cleaning and protective materials (e.g. rags, drop cloths, masking papers, etc.), paints, thinners, paint removers / strippers in accordance with the safety requirements of authorities having jurisdiction.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 06 10 10 - Rough Carpentry.

.2 Section 09 91 00 - Painting.

1.3 REFERENCES

.1 Aluminum Association (AA).
  .1 DAF 45-03, Designation System for Aluminum Finishes.

.2 American National Standards Institute (ANSI).
  .1 ANSI 208.1-79, Particleboard, Mat-formed Wood.
  .2 ANSI A208.2-2002, Medium Density Fiberboard for Interior Use.

.3 American Society for Testing and Materials International, (ASTM).
  .1 ASTM A653/A653M-02a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  .2 ASTM A924/A924M-99, Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.4 Canadian General Standards Board (CGSB).
  .1 CAN/CGSB-11.3-M87, Hardboard.

.5 Canadian Standards Association (CSA International).
  .1 CSA O121-M1978(R1998), Douglas Fir Plywood.
  .2 CSA O151-M1978(R1998), Canadian Softwood Plywood.

.6 Environmental Choice Program (ECP).
  .1 CCD-046-95, Adhesives.

.7 Porcelain Enamel Institute (PEI).
  .1 PEI 501 Porcelain Enamel.

.8 Underwriters' Laboratories of Canada (ULC).
  .1 CAN/ULC-S706-02, Wood Fibre Thermal Insulation for Buildings.

1.4 SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
  .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
    .1 For caulking materials during application and curing.
    .2 For adhesives.

.3 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate location, type, size, panel arrangement, backing, hardware, anchor or mounting details, frame or trim and accessories.

.4 Samples:
.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit duplicate 300 x 300 mm sample of each colour of bulletin board fabric with 300mm long sample of trim.

.5 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

.6 Closeout Submittals:
.1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
.2 Affix maintenance instruction labels to whiteboards.

1.5 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management and Disposal, and with the Waste Reduction Workplan.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

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

Part 2 Products

2.1 MATERIALS

.1 Whiteboards:
.1 Facing sheet: porcelain enamel 2 coats enamel on 24Ga. ceramic steel magnetic surface.
.2 Colour: White.
.3 Sizes and locations as indicated on drawings.
.4 Core: 13 mm high quality, moisture resistant, ironed clay-coat fibreboard, free of tar material.
.5 Backing material: .002mm aluminum foil for fixed units, .016mm aluminum sheet for vertical sliding panel.
.6 Laminating adhesive: to manufacturer's standard.
.7 Perimeter trim: extruded anodized aluminum.
.8 Chalk Tray: extruded anodized aluminum, ends rounded and polished.
.9 Map Rail: 25mm extruded anodized aluminum with cork inserts and aluminum end stops.
.10 Map Hooks: aluminum combination map hook and paperclip, supply 1 every 400 mm.

.11 Acceptable Materials:
- .1 Shanahan's Series
- .2 Canada White Board Company.
- .3 Allmar/Waco equal.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

.1 Install whiteboards and bulletin boards in accordance with manufacturer's instructions, parallel to floor with uniform vertical surface, plumb and level, to provide rigid, secure writing surface.

.2 Install trim around bulletin board panels. Make mitres and joints to hair-line fit, free of rough edges. Use concealed brackets to reinforce and hold joints tight and flush. No exposed fasteners permitted. Overlap trim 6 mm onto panels.

.3 Mechanical attachment:
- .1 To concrete or solid masonry use lag screw and expansion bolts or screws and fibre plugs as appropriate for stresses involved.
- .2 To hollow masonry use toggle bolts or equivalent.
- .3 To wood or sheet metal studs use screws. Secure into solid wood backing members secured in stud wall cavity suitable for support of white boards.

3.3 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

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

END OF SECTION

PART 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Project Specific Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS

.1 Section 06 10 10 - Rough Carpentry

1.3 REFERENCE

.1 OSHA Standards.

1.4 SUBMITTALS

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

.2 Shop Drawings:
  .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures. Indicate material types, arrangement of hardware, required clearances, mounting instructions.

.3 Maintenance Data:
  .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 79 00 - Closeout Submittals.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with Waste Reduction Workplan.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

1.7 WARRANTY

.1 In accordance with the Project Specific General Conditions, GC 12.3, which forms part of the Contract Documents, the warranty period for this project will commence after Stage Four Substantial Completion.

.2 Provide a written guarantee, signed and issued in the name of the owner, covering both material and workmanship for all listed products for a period of one (1) year from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 ROLLER BLINDS

.1 Manual Roller Blind:
- .1 Solarflective Manual Teleshades, SunProject or approved equal.
- .2 Chain pull roller blinds: Inside frame mounted, typical all windows except where motorized blinds are indicated.
  - .1 Fabric: 3% - 5% open PVC free, splined into drum, not taped. Colour to be selected by Consultant.
  - .2 Bottom weight bar.
  - .3 Metal Valance/Fascia.

2.2 COAT HOOKS

.1 Single Coat Hook: Bobrick B-682 or approved equal.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Install or erect listed products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Blinds are to be face of frame mount or jamb mount as required to suit existing conditions on site.

.3 Notify Consultant in writing, of conflicts between contract documents and manufacturer's instructions, so that Consultant may establish course of action.

.4 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.

END OF SECTION

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Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 REFERENCES

.1 Aluminum Association, Inc. (AA)
- .1 Designation System for Aluminum Finishes -1997.

.2 American Society for Testing and Materials (ASTM)
- .1 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B32-00, Standard Specification for Solder Metal.
- .3 ASTM B456-95, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
- .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
- .3 CGSB 31-GP-107Ma-90, Non-Inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .4 CGSB 41-GP-6M-1983, Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced. Reaffirmation of September 1976.

.4 Canadian Standards Association (CSA)
- .1 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .2 CSAW47.2-M1987(R1998), Certification of Companies for Fusion Welding of Aluminum.
- .3 CSA W59-M1989(R2001), Welded Steel Construction (Metal Arc Welding) (Imperial Version).
- .4 CSA W59.2-M1991(R1998), Welded Aluminum Construction.

.5 Canadian Sheet Steel Building Institute (CSSBI)
- .1 Sheet Steel Facts # 6, Metallic Coated Sheet Steel for Structural Building Products-July 1995.

.6 The Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual - January 2016.

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit shop drawings, catalogue sheets and full size templates.

.3 Indicate materials, thicknesses, sizes, finishes, colours, construction details, removable and interchangeable components, electrical components specifications and power loads, wiring terminal box locations, lamp centres and overlaps, access panels, mounting methods, schedule of signs.

.4 Submit full size templates drawn-to-scale details for individually fabricated or incised lettering indicating word and letter spacing.

.5 Full or 1/2 scale artwork for pictographs used will be provided by Owner.

1.4 SAMPLES

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

.2 Submit duplicate representative sample of each type sign, sign image and mounting method.

1.5 QUALITY ASSURANCE

.1 Welding Certification in accordance with CSA W47.2.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Engineer Consultant.

.6 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Engineer Consultant.

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

.8 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

1.7 MAINTENANCE DATA

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

1.8 WARRANTY

.1 Letters to be guaranteed for the life of the business against defects.

Part 2 Products

2.1 MATERIALS

.1 Acceptable Manufacturer:
  .1 Gemini Incorporated, 103 Mensing Way, Cannon Falls, MN 55009; Phone: 800-538-8377 or 507-263-3957; Fax: 800-421-1256 or 507-263-4887; Email: sales@geminisignproducts.com

.2 Sign Type 1:
- .1 Self-stick vinyl film, Individual letters and numerals die cut from 0.1mm thick vinyl Interior grade PVC film, with self-stick adhesive backing.
- .2 Colour: to be selected from standard vinyl colour range.
- .3 Size: As indicated on Interior Elevations,
- .4 Wording: letter sizes and font. Refer to interior elevations.,
- .5 Self adhering back mounted letters to 12.7mm thick clear acrylic backing. Install backing colour film after installation of letters. Polish edge to eliminate sharp edges.
- .6 Mounting: 25.4mm diameter x 19.1mm aluminum stand-offs mounted to studs. Ensure adequate backing in stud cavity.

Part 3 Execution

3.1 INSTALLATION

.1 A qualified installer shall install specified letters and logos. Provide solid wood backing for fasteners of letters and logo panel where required.

.2 Install in accordance with manufacturers recommendations and per shop drawings.

3.2 CLEANING

.1 Leave signs clean. Remove debris from interior of sign boxes.

.2 Touch up any damaged finishes.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Materials and components for tables, seating systems and other components.

1.3 REFERENCES

.1 American National Standards Institute (ANSI)
- .1 ANSI A208.1-09, Particleboard.

.2 American National Standards Institute (ANSI)/Business and International Furniture Manufacturers Association (BIFMA) International
- .1 ANSI/BIFMA X5.1-11, American National Standard for Office Furnishings, General Purpose Office Chairs - Tests.
- .2 ANSI/BIFMA X5.6-10, American National Standard for Office Furnishings - Panel Systems.
- .3 BIFMACMD-1-09, BIFMA Chair Measuring Device.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-44.227-2008, Freestanding Office Desk Products and Components.
- .2 CAN/CGSB-44.232-2008, Task Chairs for Office Work Environments.

.4 CSA International
- .1 CSA C22.2 No.9.0-96(R2011), General Requirements for Luminaires.
- .2 CAN/CSA-C22.2 No.203-M91(R2010), Modular Wiring Systems for Office Furniture.
- .3 CAN/CSA-Z809-08, Sustainable Forest Management.

.5 Forest Stewardship Council (FSC)
- .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.7 Sustainable Forestry Initiative (SFI)
- .1 SFI-2010-2014 Standard.

.8 The Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual - current edition.

.9 Underwriters' Laboratories Canada (ULC)
- .1 CAN/ULC-S102-2010, Standard Method of Test for Surfaces Burning Characteristics of Building Materials and Assemblies.

.10 Underwriters' Laboratories (UL)
- .1 UL 1286-2008(R2011), Standard for Office Furnishings.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for furniture and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit 2 copies of WHMIS MSDS.

1.5 QUALITY CONTROL

.1 Furniture to be assembled and installed by crew certified by respective manufacturer to install their product.

.2 Supplier to provide contact information.

1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data for furniture for incorporation into manual.

.2 Supply part numbers of furniture to allow for replacement of worn or damaged furniture parts.

.3 Supply instructions detailing procedures for repairing or replacing worn furniture parts.

.4 Provide contact information for closest supplier of materials for repairing or replacing worn furniture parts.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Site Access: Contractor will be granted access to the site on or around Substantial Completion of the current renovation project.

.3 Storage and Handling Requirements:
.1 Products and materials to be stored off site until access to the site is granted. Contractor is to pay costs for storage and handling of products and materials while off site. Coordinate delivery with General Contractor to minimize storage time.
.2 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.3 Store and protect furniture from nicks, scratches, and blemishes.
.4 Replace defective or damaged materials with new.

1.8 HEALTH AND SAFETY

.1 Contractor will be required to follow direction from site General Contractor for coordination of site access.

.2 Contractor will be required to follow direction from site General Contractor as it applies to onsite Health and Safety and ensure all on site staff attend a Health and Safety Meeting with the site General Contractor prior to access to the job site.

.3 Contractor to submit a copy of their firm’s Health and Safety Manual and a current WSIB Certificate.

1.9 WARRANTY

.1 Furniture manufacturer to provide a written ten (10) year warranty for manufacturer's defects and durability under normal usage.

Part 2 Products

2.1 FURNITURE

.1 Refer to Furniture Schedule on A 7.0 Series Drawings for furniture requirements.

Part 3 Execution

3.1 ASSEMBLY AND PLACEMENT

.1 Assemble furniture on site to manufacturers written instructions

.2 Place furniture in accordance with attached documents.

.3 Clean furniture and protect from damage.

.4 Recycle packing and shipping materials. Minimize transport of waste material to landfill.

END OF SECTION