SPECIFICATIONS for
University Centre Washroom and Student Space Renovations

University Centre, Building No.158

University of Guelph Project Number 504000

January 11 2017

MASRI O ARCHITECTS

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1.0 Project Title	Student Space & Washroom Renovations, University Centre
2.0 Owner	The University of Guelph 50 Stone Road East Guelph, Ontario N1G 2W1 Attention: Design, Engineering and Construction, Physical Resources, J.C. Hersey Building Telephone: (519) 824-4120 Facsimile: (519) 837-0581
3.0 Consultants	
3.1 Architectural	Masri O Inc. Architects 609 Kumpf Drive, Suite 101 Waterloo, ON N2V 1K8 Attention: Reema Masri Telephone: (519) 579-0072
3.2 Structural	MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, ON N2B 3X9 Attention: Allister Mason Telephone: (519) 743-6500
3.3 Mechanical	DEI & Associates 40 Durward Place Waterloo, ON N2L 4E4 Attention: Andrew Henderson Telephone: (519) 725-3555
3.3 Electrical	DEI & Associates 40 Durward Place Waterloo, ON N2L 4E4 Attention: Jeremy Jackson Telephone: (519) 725-3555

**********END**********

The specification sections listed below are the University of Guelph *Standard Specification Sections*.

These *Standard Specification Sections*, showing the date *November 2016* in each specification footer, as applicable, govern the work of all construction contracts between the Contractor and the University of Guelph (Owner) as represented by Physical Resources, until the earlier of:

.1 replacement, additional and/or modified specification section(s) are issued for a particular project or contract, or;
.2 the University issues revised *Standard Specification Sections, or;*
.3 the University revokes these *Standard Specification Sections.*

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E-7	FIRST FLOOR POWER RENOVATION PLANS
E-8	SCHEDULES & DETAILS

**********END**********

1. INVITATION

1.1 Offers, signed, executed, dated, and in compliance with the Instructions to Bidders shall be received by the Owner through the MERX Electronic Bid Submission (EBS) system from pre-qualified General Contractors only.

2. COMPLIANCE

2.1 The Bidder acknowledges that by submitting a compliant bid, it has accepted an offer by the Owner to enter into a "bid contract" for the evaluation of bids and the award of the Contract, if an award is made. The Bidder acknowledges that the terms of the "bid contract" are represented by the Bid Documents.

2.2 Failure to submit a bid which complies with the requirements of these Instructions to Bidders may cause a bid to be declared non-compliant and therefore not considered by the Owner.

2.3 The Owner reserves the right to waive any non-compliance and accept such a Bid, if, in the Owner's opinion, any such non-compliance does not give such Bidder an unfair advantage over the other Bidders.

3. BID DOCUMENTS

3.1 Definitions

.1 Contract Documents: Defined in CCDC2-2008 Edition, Definitions, as amended.
.2 Bid Documents: Contract Documents supplemented with Instructions to Bidders, Bid Form, bid securities, and Supplementary Bid Forms as identified herein.
.3 Bid, Offer, or Bidding: Act of submitting an offer under seal.
.4 Bid Price: Monetary sum identified by the Bid Form.

3.2 The following documents form the basis of this bid process (the "Bid Documents"):

.1 Instructions to Bidders
.2 Bid Forms comprising the Base Bid Form, the List of Subcontractors and Contract Breakdown, the Supplementary Bid Form – Itemized and Alternative Prices, the Supplementary Bid Form – Unit Prices
.3 Agreement, Definitions and General Conditions of the CCDC 2 - 2008
.4 Supplementary Conditions
.5 Specifications (per table of contents)
.6 Drawings (per list of drawings)
.7 Addenda issued during bidding period

3.3 Check Bid Documents for completeness upon receipt. Inform Consultant immediately:

.1 should any documents be missing or incomplete;
.2 upon finding any discrepancies or omissions.

3.4 Complete sets of Bid Documents are available only through **MERX.** Copies will not be made available from Physical Resources, Hersey Building, University of Guelph (office of the Owner). Bid Documents will **not** be issued by e-mail, mail or courier.

3.5 Pre-qualified general contractors or pre-qualified subcontractors may obtain Bid Documents through MERX. All others shall refer to the General Contractor for information, or review the documents in the office of the Consultant and the Owner.

3.6 Bid Documents may be viewed at the project ftp site at links emailed to pre-qualified bidders. Bid Documents may also be reviewed at office of the Prime Consultant and the Owner by appointment. Bid documents may also be viewed at the offices of the Grand Valley Construction Association;

3.7 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 license or grant for any other purpose.

3.8 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.

4. CONDITIONS OF THE PLACE OF THE WORK

4.1 The Place of the Work is located at the **University of Guelph,** ***50 Stone Road East, University Centre Building #158.***

4.2 Before submitting a bid, investigate the Place of the Work to fully ascertain existing conditions, circumstances and limitations affecting the Work. No allowances shall be made for additional costs and no claims shall be entertained in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence prior to submitting a bid. In submitting a bid, bidders warrant and certify that the bidder has visited the site and ascertained site conditions.

4.3 Conditions Above Acoustic Tile Ceilings: conditions visible above existing suspended acoustic tile ceilings shall be considered exposed conditions for the purposes of making findings under the provisions of this Contract, and the Bidder is solely responsible for ascertaining these conditions prior to bid submission.

4.4 Additional Information: Partial drawings of the existing building are available for review at the office of the Owner. Neither the Owner nor the Consultant represent nor warranty that these drawings are complete or accurate, and these drawings are made available for bidders' information only.

4.5 The reports prepares or obtained with respect to the Place Of Work area available through the Consultant/Owner:

.1 Known or suspected asbestos containing materials (ACM) for Building 158 (University Centre) by Pinchin Ltd. dated 17. 02.2016..

.2 Certificate of Analysis by Lex Scientific for Bulk Asbestos in Plaster in Building 158 (University Centre) and Drywall Mud dated 17.02.2016.

5. MANDATORY SITE MEETING

5.1 A mandatory site meeting for all pre-qualified general contractors and pre-qualified subcontractors has been scheduled on **January 19 2017 @ 1pm** at the ***Place of the Work*** **University Centre Bldg#158, Room 103*.*** All bidders must attend and will be required to sign the "Site Meeting Log" to confirm their attendance.

5.2 Failure to attend shall result in disqualification of bidders and/or pre-qualified subcontractors for work of this Contract. Bids received from bidders who failed to attend the mandatory site meeting, as determined from the "Site Meeting Log", shall be returned unopened.

5.3 Representatives of the Consultant and/or the Owner will be in attendance and will conduct the bidders' briefing and tour.

5.4 Bidders and their sub-trades are required to be familiar with all matters discussed at this briefing and tour, and submission of bid shall be taken as warranty that the bidder and his trades are familiar with all site conditions and all matters discussed at the site briefing and tour.

6. PRE-QUALIFICATION

6.1 The following bidders have been pre-qualified:

.1 Only pre-qualified general contracting firms named below may submit a bid as General Contractor for this Contract:

Brown Daniels Associates Inc.
Compass Construction Resources Ltd.
Harbridge & Cross Ltd.
M.J. Dixon Construction ltd.
Steelcore Construction Ltd.
TRP Construction

.2 Only pre-qualified firms named below may submit a bid to pre-qualified general contracting firms (named above) for Mechanical work (Division 20) of this Contract.

Conestogo Mechanical
Dean Lane Contractors
Jay Stewart Mechanical
Modern Niagara
Roberts Onsite Inc.
Trade-Mark Industrial Inc
L.J. Barton Mechanical Inc.

.3 Only pre-qualified firms named below may submit a bid to pre-qualified general contracting firms (named above) for electrical work (Division 26) of this Contract.

John Raepple Electric Ltd.
Naylor Electric
Fairway Electrical Services Inc.
P & S Electric
Roberts Onsite Inc.
Trade-Mark Industrial Inc.
L.J. Barton Mechanical Inc.

.4 Only pre-qualified firms named below may submit a bid to pre-qualified general contracting firms (named above) for telecommunications cable (telephone or data) work (generally Division 17) of this Contract.

Demarcation Point
Phonemaster Services Ltd.
Vollmer Inc.
BNR Electric Inc.
Electri-Tech Services Inc.
Roberts Onsite Inc.

.5 Only pre-qualified firms named below may submit a bid to pre-qualified general contracting firms (named above) for Fire Alarm Testing & Fire Suppression work (Division 21&28) of this Contract.

Vipond Fire Protection

6.2 Bidders must use only Subcontractors as noted in the above section 6.1

6.3 Bids received from bidders which have not been pre-qualified shall not be accepted and shall be returned unopened.

6.4 Bids received from Bidders who fail to comply with 6.1.2, 6.1.3, 6.1.4, 6.1.5, and 6.2 shall be declared non-compliant.

7. BID AND PERFORMANCE SECURITY

7.1 Each bid shall be accompanied by bid security in the form of a bid bond in the amount of $100,000.00 naming the Owner as oblige and issued by a surety licensed to conduct surety and insurance business in Ontario. The bid security is for the benefit of the Owner and stands as security that the bidder, if awarded the Contract, shall deliver the performance security and evidence of insurance and other documents required by these Instructions to Bidders or by the Contract, and shall execute the Contract. The bid security shall remain valid for a period of sixty (60) days from the date of bid submission. No other form of bid security is acceptable.

7.2 The bid security of the bidder whose bid is accepted shall be retained by the Owner to compensate the Owner for the damages it shall 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.

7.3 The bid security of the bidder whose bid is accepted shall 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. The bid security of all other bidders shall 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.

7.4 Each bid shall be accompanied by an agreement to bond issued by the same surety company that provides the bid bond, undertaking to provide a fifty percent (50%) performance bond and a fifty percent (50%) labour and material payment bond, both to be delivered to the Owner if the bidder is awarded the Contract.

7.5 Bids not accompanied by the required bid security and the required agreement to bond ***shall*** be declared non-compliant.

7.6 Include the cost of all bonds in the bid price.

8. AMENDMENTS TO BID DOCUMENTS

8.1 Direct questions arising during the bidding period by email only to:

Aaron Johnston
Masri O Inc. Architects
ajohsnton@masrio.ca

The Bid Coordinator is the sole contact for bidding on this Project. A bid may be disqualified where contact is made with any person other than the Bid Coordinator.

8.2 Neither the Owner nor the Consultant will be responsible for instructions, clarifications or amendments communicated orally. Instructions, clarifications or amendments which affect the Bid Documents may only be made by addendum.

8.3 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 in writing, and not less than seven (7) Working Days before the bid closing date, so that the Consultant may, if the Consultant deems it necessary, issue instructions, clarifications or amendments by addendum to all bidders to whom bid documents have been issued prior to the bid closing date. The Consultant shall issue such addenda at least seven (7) calendar days prior to bid closing. Any and all addenda will be available only through MERX.

8.4 Product/System Options

.1 Where the Bid Documents stipulate a particular product, alternatives shall be considered by the Consultant up to seven (7) working days before receipt of bids.

.2 When a request to substitute a product is made, the Consultant may approve the substitution and if

approval is granted shall issue an Addendum to known bidders.

.3 In submission of alternatives to products specified, bidders shall include in their bid any changes required in the work to accommodate such alternatives. A later claim by the Contractor for an addition to the Contract Price because of changes in work necessitated by use of alternatives shall not be considered.

.4 Alternative products may be considered if submitted as an attachment to the Bid Form, in accordance with the following:

.1 The submission shall provide sufficient information to enable the Consultant to determine acceptability of such products.

.2 Provide complete information on required revisions to other work to accommodate each alternative, the advantages and disadvantages of the proposed alternative, effect on schedule, trades affected, and the dollar amount of additions to or reductions from the Bid Price, including revisions to other work. Proposals for alternatives shall be signed, dated and sealed in the same name as the person who has signed and sealed the Bid Form.

.3 Unless alternatives are submitted in this manner and subsequently accepted, provide products as specified.

.5 The Owner will not necessarily accept alternatives proposed by the bidder.

.6 Accept full responsibility that a proposed alternative will not exceed dimensional requirements as indicated on the Drawings, that it is compatible in all ways with other specified work, that coordination and cost of installation is included in his price for the proposed alternative and that the Contractor shall be responsible for additional engineering/design requirements.

8.5 Addenda issued during the bidding period shall become part of the Bid Documents and their receipt shall be acknowledged in the space provided on the Bid Form. Failure to acknowledge the addenda issued **will** result in the bid being declared as non-compliant. Addenda will be issued through MERX.

9. TAXES

9.1 Value Added Taxes shall ***not*** be included in the bid price. All other eligible taxes shall be included in the bid price. Any changes to taxes announced prior to the date of the issuance of these Bid Documents and scheduled to come into effect subsequent to it shall be taken into consideration in preparing the bid price.

9.2 All invoices or progress payments for work shall clearly show the amount of Value Added Tax applicable to the work completed.

10. BID COMPLETION

10.1 Fill in all blank spaces on the Bid Forms in ink, or typewritten, providing all information requested, and ensure that an authorized person or persons sign all forms where indicated. 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.

10.2 Use only the Bid Forms issued as part of the Bid Documents for the Project. If any or all pages of the Bid Forms are amended by addendum, only the amended pages shall be used to submit a bid. Failure to comply with this paragraph may result in the bid being declared non-compliant.

10.3 Information provided by bidders on the Bid Forms may be amended prior bid closing, in accordance with the rules provided by MERX. Other modifications, erasures, additions, conditions, qualifications or un-initialed pre-closing amendments may result in the bid being declared non compliant.

10.4 Bids including any supplementary bid forms that are not originals, are unsigned, improperly signed, un-initialed, incomplete, conditional or illegible, may be declared non-compliant.

10.5 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.

10.6 Completion of the Work

.1 Where required, state the date of completion of the Work on the Bid Form.

.2 The work of this contract shall be completed as quickly as possible and consideration may be given to time of completion when reviewing the submitted bids.

10.7 Listing of Subcontractors and Contract Breakdown

.1 Where required by the Bid Documents, a bidder shall submit a List of Sub-contractors and Contract Breakdown that the bidder proposes to perform an item of the “Work" called for by the Contract by completing and submitting the List of Sub-contractors and Contract Breakdown. Failure of the bidder to list Sub-contractors and Contract Breakdown, where required, or the listing by a bidder of more than one Sub-contractor and Contract Breakdown to perform or supply an item of work listed, may result in the bid being declared non-compliant.

.2 Should the bidder be awarded the Work, parties named, including bidder’s own forces, shall be used to perform the work for which they are named and shall not be changed without the Owner’s written consent.

.3 Where a bidder lists “own forces" in lieu of a Sub-contractor, the bidder shall carry out such item of the “Work" with its own forces. Where "own forces" have been listed by a 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 item of the “Work". If the Owner, acting reasonably, determines that the bidder's "own forces" are not sufficiently qualified or sufficiently experienced to undertake such item of the Work", it may declare the bid as non-compliant.

.4 Costs requested shall be for the specific trade or division of work. The cost should not include the bidder’s general cost or mark-up. The cost information is for confidential information and use by the Owner.

10.8 Itemized, Separate and Alternative Prices

.1 Where required by the Bid Documents, a bidder shall submit Itemized, Separate and Alternative Prices.

.2 Itemized Prices for work, if any, shall be included in the bid price. The itemized price shall be based on the materials, equipment and systems specified. The itemized price shall include all labour, materials, equipment, overhead and profit and all other charges except as otherwise stipulated. No additional mark-ups will be permitted. Except as instructed otherwise in writing, Contractor shall verify and include all code and municipal/provincial requirements associated with proposed Itemized Prices.

.3 Separate Prices, requested in the Tender Documents, shall not be included in the bid price. Consistent with their acceptance or rejection by the Owner, they will be carried in the Agreement as an amount separated from the Contract Amount or in a separate agreement. The separate price shall be based on the materials, equipment and systems specified. The separate price shall include all labour, materials, equipment, overhead and profit and all other charges. No additional mark-ups will be permitted. Except as instructed otherwise in writing, Contractor shall verify and include all code and municipal/provincial requirements associated with proposed Separate Prices. Separate Prices shall be irrevocable for a period of sixty (60) days. The Owner reserves the right to accept or reject any or all separate prices submitted.

.4 Alternative Prices for work, if any, shall adjust the bid price based upon acceptance or rejection of the alternative. The alternative price shall be based on the materials, equipment and systems specified. The alternative price shall include all labour, materials, equipment, overhead and profit and all other charges except as otherwise stipulated. No additional mark-ups will be permitted. Except as instructed otherwise in writing, Contractor shall verify and include all code and municipal/provincial requirements associated with proposed Alternative Prices. Alternative Prices shall be irrevocable for a period of sixty (60) days. The Owner reserves the right to accept or reject any or all alternative prices submitted.

10.9 Unit Prices.

.1 Where required by the Bid Document, a bidder shall submit Supplementary Bid Form - Unit Prices. The unit price shall be based on the materials, equipment and systems specified.

10.10 Bid Signing

.1 The bid form and any supplementary bid forms shall be signed by the bidder.

.2 Sole Proprietorship: Printed name and signature of sole proprietor. The signature shall include the name and signature of a witness to the proprietor's signature.

.3 Partnership: Printed name and signature of one partner authorized to bind the partnership. Insert the word partner under signature. The signature shall include the name and signature of a witness to the partner's signature.

.4 Limited Company: Printed name and signature of a signing officer authorized to bind the company in their normal signatures. Insert the officer's capacity in which the signing officer acts, under the signature.

10.11 Eligibility of Bids

.1 Bids that are improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind may, at the sole discretion of the Owner, be declared non-compliant.

.2 Bids that fail to include security deposit, bonding or insurance requirements **shall** be declared non-compliant.

.3 Bids received after the time of bid close shall not be accepted and shall be returned unopened.

.4 Bids received from bidders who failed to attend a mandatory pre-bid site visit may, at the sole discretion of the Owner, be declared non-compliant.

.5 Unsigned bids **shall** be declared non-compliant.

11. BID SUBMISSION

11.1 Submit one (1) completed original of each of the Base Bid Form and any required supplementary bid forms, accompanied by the bid bond and the agreement to bond, electronically to the University of Guelph through MERX EBS, the electronic tendering system used by the University.

11.2 Bids must be received before and not later than **3:00:00**pm local time on ***February 1 2017.*** The term "local time" shall mean the time as measured by MERX EBS system.

11.3 Bids will be date and time stamped electronically by MERX EBS.

11.4 **Late bids will not be accepted by MERX**.

11.5 Bids which are submitted by facsimile transmission or by electronic means shall **not** be considered.

11.6 Bidders are solely responsible for ensuring that their bids are downloaded and submitted (2 steps) to MERX EBS prior to the date and time specified above.

11.7 File size shall not exceed 100 MB. File names shall not exceed more than 100 characters.

12. DELIVERY OF SUPPLEMENTARY BID INFORMATION

12.1 Submit one (1) completed original of each of the supplementary bid forms ***A, B, C, D , E & F*** electronically to the University of Guelph through MERX EBS, the electronic tendering system used by the University.

12.2 Bids must be received before and not later than **3:00:00pm** local time on ***February 1 2017.*** The term "local time" shall mean the time as measured by MERX EBS system.

12.3 Bids will be date and time stamped electronically by MERX EBS. Bidders should expect an almost instantaneous confirmation that their bid was accepted by MERX EBS.. Supplementary bid information should be submitted at same time and together with the main bid form.

12.4 **Late bids will not be accepted by MERX**.

12.5 Bids which are submitted by facsimile transmission or by electronic means shall **not** be considered.

12.6 Bidders are solely responsible for ensuring that their bids are downloaded and submitted (2 steps) to MERX EBS prior to the date and time specified above.

12.7 Failure to submit any of the supplementary bid forms will result in the bid being declared non-compliant.

12.8 Ensure that file size is 100 MB or smaller and that your file name is not more than 100 characters in length.

13. BID EXPIRY PERIOD

13.1 Bids shall be irrevocable for a period of sixty (60) days from the date of submission of the base Bid Form, after which period the bid expires.

14. BID OPENING

14.1 Bids shall be received and reviewed in private.

15. REQUESTS FOR CLARIFICATION

15.1 The Consultant/Owner may contact any one or more bidders to request clarification without any obligation to contact other bidders. Such additional clarification shall be provided promptly by the bidder to the Consultant/Owner.

15.2 The Consultant/Owner may solicit additional information after close of bids from any or all bidders to support bid evaluation.

15.3 The Owner reserves the right to request supplementary information from one or more bidders after close of bids, without affecting the validity of the bids submitted, as may be required to facilitate the Owner’s decision to award a contract, if any.

15.4 Requests for information shall not be construed as acceptance of a bid.

16. NOT USED

17. AWARD OF CONTRACT, EXECUTION OF THE CONTRACT AND DOCUMENTS TO BE DELIVERED

17.1 Bidders shall not issue or make any statement 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.

17.2 If the Owner decides to award the Contract to a bidder, it will issue a “Letter of Intent” to award a contract. The Owner will also sign the Bid Form and Contract Agreement indicating the Owner’s acceptance of the Bid.

A copy of the accepted bid will be provided to the Contractor.

17.3 Not Used

17.4 An award of a contract will be based on the lowest compliant bid - without consideration of alternatives.

17.5 Prior to commencing the “Work", the Contractor shall deliver to the Owner:
.1 certified true copies of the insurance policies required by the Bid Documents; and
.2 a current Clearance Certificate issued by the Workplace Safety and Insurance Board.
.3 a signed AODA Supplier Compliance Form

17.6 The Owner may not necessarily award the contract to the lowest bidder or to any bidder. The Owner reserves the right to waive any non-compliant bid and accept such a Bid, if, in the Owner’s opinion, any such non-compliance does not give such Bidder an unfair advantage over the other bidders. The Owner reserves the right to accept or reject any or all bids, and to award the contract to the Bidder whose bid, in the Owner’s sole and absolute discretion, is considered to be in the best interests of the Owner.

17.7 If the Owner does not receive any bid satisfactory to the Owner, in its sole and absolute discretion, the Owner reserves the right to re-bid the Work, or negotiate a contract for the whole or any part of the Work with any one or more persons, including one or more of the bidders.

17.8 The Owner takes no responsibility for the accuracy of the information supplied during the bid period unless provided in writing, and takes no responsibility for any bidder lacking information.

17.9 The award of a contract will be posted on MERX. No other notification of award to the unsuccessful bidders will be made.

18. LIMIT OF LIABILITY

18.1 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 value of the bid bond.

18.2 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 sum of ***Five-Thousand*** **Dollars ($*5,000.00)*** and the reasonable cost to the Bidder of preparing its bid.

19. CONFLICT OF INTEREST

19.1 The bidder agrees to be bound by the following requirements:

1. That no person either natural or body corporate, other than the bidder, has or will have any interest or share in this bid or in the proposed Agreement;
2. That there is no collusion or arrangement between the bidder and any other bidder (s) in connection with this Project;
3. That the bidder has no knowledge of the contents of other bids and has made no comparison of figures, agreements, arrangements, expressed or implied, with any other party in connection with the making of the bid;
4. Neither the bidder nor members of his/her immediate family or any employee of the bidder shall have any direct or indirect interest in any other entity that provides goods or services to the Project. Bidder shall immediately disclose any potential conflict of interest should it arise before, during or after this bid and/or any award of contract;
5. Neither the bidder nor members of his/her immediate family or any employee of the bidder shall offer or receive any reimbursement from or to any employee of The University, from or to any vendor, consultant

or contractor employed by The University except as token gifts in accordance with University policy governing this matter.

20. DISPUTES

20.1 In the event of a dispute arising in connection with this bid process including, without limitation, a dispute concerning the existence of the "bid contract" or a breach of the "bid contract", or a dispute as to whether the bid of any bidder was submitted on time or whether a bid is compliant, the Owner may refer the dispute to a confidential binding arbitration pursuant to the *Arbitration Act, 1991,* as amended, before a single arbitrator with knowledge of procurement/bidding law. In the event that the Owner refers the dispute to arbitration, the bidder agrees that it is bound to arbitrate such dispute with the Owner. Unless the Owner shall refer such dispute to binding arbitration, there shall be no arbitration of such dispute.

20.2 In the event the Owner refers a dispute to binding arbitration, the Owner may give notice of the dispute to one or more of the other bidders who submitted bids, whether or not they may be compliant, each of whom shall be a party to and shall be entitled to participate in the binding arbitration, and each of whom shall be bound by the arbitrator's award, whether or not they participated in the binding arbitration.

20.3 In the event the Owner refers a dispute to binding arbitration, the parties to the arbitration shall exchange brief statements of their respective positions on the dispute, together with the relevant documents, and submit to a binding arbitration hearing which shall last no longer than two days, subject to the discretion of the arbitrator to increase such time. The parties further agree that there shall be no appeal from the arbitrator's award.

20.4 This Article is not intended to form part of any "bid contract" that may come into being between a bidder and any prospective Subcontractor or Supplier of that bidder.

21. DEBRIEFING

21.1 Each Bidder who submits a bid in response to this request for bids is entitled to a debriefing process.

21.2 In the event a Bidder wishes to obtain information on their bid relative to this call for bids, the Bidder must make such a request, in writing, to the Owner within sixty (60) days after award is made.

21.3 The debriefing process will occur only after the award of a contract for the work.

21.4 The debriefing process will cover the following criteria, relative to their bid only:
price;
quality of tender submission.

21.5 The debriefing process with a bidder will not address any issues, questions or concerns regarding the bid of any other bidder, including the bid of the successful bidder.

22. ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT (AODA)

22.1 The University is committed to fostering, creating and maintaining an accessible environment for all individuals under the Accessibility for Ontarians with Disabilities Act (AODA).

22.2 Each Proponent agrees to:

(a) comply with the accessibility standards established under the AODA by the Ontario Government and adhere to the University's policies and procedures in regards to accessibility as well as to ensure all of its subcontractors similarly do the same;
(b) ensure that training on the requirements of the accessibility standards are provided to those of its employees who will be working with the public (students, staff, faculty, visitors or other third parties) at, or on

behalf of, the University and who participate in developing the proponent's policies, practices or procedures;
(c) keep records of such training; and
(d) provide such records when required by the University.

22.3 For proponent(s) who will be working with the public (students, staff, faculty, visitors or other third parties) at, or on behalf of, the University, the University will require the successful proponent(s), upon Notice of Award, to provide to the University with a signed AODA Supplier Compliance Form prior to commencing any work for the University.

The AODA Supplier Compliance Form is available at:

https://www.uoguelph.ca/finance/sites/uoguelph.ca.finance/files/FF020.0503%20AODA%20Supplier%**20Compliance**%20Form.pdf

23. HUMAN RIGHTS AND SEXUAL AND GENDER HARASSMENT POLICIES

23.1 Proponents agree to be governed by the provisions of the Ontario Human Rights Code. In furtherance of the commitment, the Proponents agree to comply with the provisions of the University's Human Rights Policy and Procedures. The Proponents also agree to comply with any successor policies and procedures to the document that the Owner's Board of Governors may approve. Proponents shall refer to www.uoguelph.ca/hre/hr.shtml for more information.

END OF INSTRUCTIONS

PART ONE - GENERAL

1.1 Reports

.1 The following material bound herein (or in a separate volume of the Contract Documents) is included for information or is available from the Owner/Consultant (for complex data, provide copies with each bid package).

.1 Known or suspected asbestos containing materials (ACM) for Building 158 (University Centre) by Pinchin Ltd. dated 17. 02.2016..

.2 Certificate of Analysis by Lex Scientific for Bulk Asbestos in Plaster in Building 158 (University Centre) and Drywall Mud dated 17.02.2016.

.2 The above material cannot, by its nature, reveal all conditions that may exist at the Place of the Work. Should conditions be found to vary substantially from the above, advise the Consultant accordingly and request direction.

1.2 Drawings

.1 The following material is included for information or is available from the Owner/Consultant:

.1 Existing building drawings (Architectural, Structural, Mechanical and Electrical)

**********END**********

1.0 Bid Bond	.1 Bids shall be accompanied by a bid bond in the amount of *One Hundred Thousand dollars ($100,000)* in Canadian funds. .2 Endorse the bid bond in the name of the Owner as oblige, signed and sealed by the principal (Contractor) and surety. .3 Use bid bond Form CCDC 220, or a form of equal content acceptable to Owner. .4 Include the cost of the bid bond in the Bid Price. .5 Security deposits will be returned after delivery to the Owner of the required surety bonds by the Contractor. .6 If no contract is awarded, all security deposits will be returned.
2.0 Performance Bond, Labour and Materials Payment Bond	.1 Provide to the Owner a Performance Bond in the value of 50% of the original Contract Price plus Value Added Tax, and a Labour and Materials Payment Bond in the value of 50% of the original Contract Price plus Value Added Tax.

**********END**********

1. GENERAL

1.1 The Standard Construction Document for Stipulated Price Contract, CCDC 2 – 2008, English version, 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,* as amended by Section 00 73 03 Supplementary Conditions and with the following amendments, additions and modifications:

2. SUPPLEMENTARY CONDITIONS

Refer to Section 00 73 03 Supplementary Conditions for amendments to the General Conditions of CCDC 2 - 2008.

3. REVISIONS TO ARTICLES OF CCDC 2 - 2008

3.1 ARTICLE A-5 PAYMENT

3.1.1 Into the blanks in Article 5.1, insert the following words, in their respective locations:

"ten" and "10".

3.1.2 Delete paragraph 5.1.2 in its entirety and substitute the following:

"5.1.2 Upon Substantial Performance of the Work as certified by the Consultant, and after all Lien Rights regarding the work performed have expired, pay to the Contractor the unpaid balance of Holdback monies then due, together with such Value Added Taxes as may be applicable to such payment, and".

3.1.3 Delete paragraph 5.1.3 in its entirety and substitute the following:

"5.1.3 Upon receipt of the Consultant's final certificate for payment, and after all Lien Rights for finishing work have expired, pay to the Contractor the unpaid balance of the Contract Price then due together with such Value Added Taxes as may be applicable to such payment."

3.1.4 Delete sentences (1) and (2) found in Article 5.3, paragraph .1 and replace with the following:

(1) 1% per annum above the prime rate for the first 90 days.
(2) 2% per annum above the prime rate after the first 90 days.

3.1.5 Into the blank in Article 5.3, paragraph .1, insert the following words":

"Royal Bank of Canada".

3.2 ARTICLE A-6 RECEIPT AND ADDRESSES FOR NOTICES IN WRITING

3.2.1 Delete Article A-6.1 and substitute new article 6.1 as follows:

6.1 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 or email 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 or email with proof of delivery 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 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.

3.3 DEFINITIONS

3.3.1 Add the following new definitions:

27. Make Good
"Make Good" means to restore new or existing work after being damaged, cut or patched or rejected by the *Consultant*. Use materials identical to the original materials, with new visible surfaces matching the appearance and the expected performance of the original surfaces in all details, with no apparent junctions between the new and existing surfaces.

28. Mark-up
Markup means the *Contractor's* or the *Subcontractor's* (in the case of work being done by the *Subcontractor*) add for profit and overhead costs as related to the General Conditions and the Sections of Divisions 0 and 1 of the *Specifications* including costs of extension of contract time, office overhead, field supervision, layouts, co-ordination, travelling expenses and any other direct or indirect costs.

29. Submittals
Submittals are documents or items required by the *Contract Documents* to be provided by the *Contractor,* such as:
- *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
- Record drawings and manuals to provide instructions to the operation and maintenance of the *Work.*

30. Toxic and Hazardous Substances
Toxic and Hazardous Substances shall mean designated substances as defined by applicable statutory and regulatory requirements.

END OF SECTION

1. GENERAL

1.1 The Standard Construction Document for Stipulated Price Contract, CCDC 2 – 2008, English version, 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,* as amended by the amendments, additions and modifications which follow.

1.2 These Supplementary Conditions shall be read together with and will govern over the General Conditions of CCDC 2 – 2008.

1.3 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.

2. GC 1.1 CONTRACT DOCUMENTS

2.1 Add to the end of subparagraph 1.1.2.2:

"except where the *Consultant* shall be indemnified as a third party beneficiary as provided in subparagraphs 9.2.7.4, 9.5.3.4 and in 12.1.3."

2.2 Add new sentence to the end of paragraph 1.1.6 as follows:

The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Consultant* to settle disputes among the *Subcontractors* and *Suppliers* in respect to such divisions. The *Contractor* is solely responsible for the coordination of *Subcontractors*. The *Contractor* is solely responsible for the division and definition of work between *Contractor* and *Subcontractors* and for any jurisdictional matters arising therefrom.

2.3 Add new subparagraph 1.1.7.5 as follows:

"1.1.7.5 in case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the *Contract Documents."*

2.4 Delete paragraph 1. 1.8 in its entirety and substitute new paragraph 1. 1.8 as follows:

1.1.8 "The *Owner* shall provide the *Contractor,* without charge, one (1) electronic copy on compact disc of the *Contract Documents,* exclusive of those required by jurisdictional authorities and the executed *Contract Documents*. Reproduction of the CD or printing from the CD will be at the *Contractor*'s expense."

2.5 Add new paragraph 1.1.11 as follows:

1.1.11 Wherever the words "approved", "as directed", "submit", "make good", "reviewed", or similar wording or phrases appear throughout the *Contract Documents*, they shall be understood unless otherwise provided, to mean materials or items referred to shall be "as approved by the *Consultant*", "as directed by the *Consultant*", "make good to the *Consultant*'s satisfaction", "submit to the *Consultant*", or "reviewed by the *Consultant*".

3. GC 2.2 ROLE OF THE CONSULTANT

3.1 Add new sentence to the end of paragraph 2.2.2 as follows:

"Such reviews, or lack thereof, shall not give rise to any claims by the *Contractor* in connection with construction safety at the *Place of the Work*, responsibility for which belongs exclusively to the *Contractor*."

3.2 Revise in paragraph 2.2.14 as follows:

Delete the comma after the word “submittals” and add the words “which are provided” before the words “in accordance”.

4. GC 2.4 DEFECTIVE WORK

4.1 Add new subparagraphs 2.4.1.1 and 2.4.1.2 as follows:

2.4.1.1 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.*

2.4.1.2 The *Contractor* shall prioritize the correction of any defective work which, in the sole discretion of the *Owner,* adversely affects the day to day operation of the *Owner.*

4.2 Add the new words to the beginning of paragraph 2.4.3 as follows:

“Except for defective work or work not performed that may lead to dangerous circumstances and subject the workers to potential or actual health and safety hazards, if in the opinion …….”

4.3 Add new paragraph 2.4.4 as follows:

2.4.4 Defective work or work not performed that may lead to dangerous circumstances and subject workers to potential and actual health and safety hazards shall be immediately corrected, completed and otherwise made safe.

5. GC 3.1 CONTROL OF THE WORK

5.1 Add new paragraph 3.1.3 as follows:

3.1.3 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 obtain written instructions notify the *Consultant* in writing and obtain written instructions from the *Consultant* before proceeding with any part of the affected work.

6. GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

6.1 Delete subparagraph 3.2.2.1 in its entirety.

6.2 Delete subparagraph 3.2.2.2 in its entirety.

6.3 Add new subparagraph 3.2.3.4 as follows:

3.2.3.4 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 under the Occupational Health and Safety Act.

7. GC 3.4 DOCUMENT REVIEW

7.1 Delete paragraph 3.4.1 in its entirety and substitute new paragraph 3.4. 1 as follows:

3.4.1 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.*

7.2 Add new paragraph 3.4.2, 3.4.3, 3.4.4, 3.4.5 and 3.4.6 as follows:

3.4.2 If the *Contractor* finds discrepancies in 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.

8. GC 3.5 CONSTRUCTION SCHEDULE

8.1 Delete paragraph 3.5.1 in its entirety and substitute new paragraph 3.5.1 as follows:

3.5.1 The *Contractor* shall,

3.5.1.1 Subject to building permit availability, commence *Work* immediately upon award of *Contract* and provide sufficient expertise and resources to ensure the steady progress of the *Work* including overtime work, if required, to perform the *Work* within the *Contract Time* and in accordance with the approved construction schedule.

3.5.1.2 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;

3.5.1.3 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 3.5.1.2 or any successor or revised schedule accepted by the *Owner* pursuant to GC3.5;

3.5.1.4 Monitor the progress of the *Work* on a weekly basis relative to the construction schedule reviewed and accepted pursuant to paragraph 3.5.1.2, or any successor or revised schedule accepted by the *Owner* pursuant to GC 3.5, update the schedule on a monthly basis, submit the updated schedule with each application for a progress payment and advise the *Consultant* and the *Owner* in writing of any variation from the baseline or slippage in the schedule; and

3.5.1.5 If, after applying the expertise and resources required under paragraph 3.5.1.3, the *Contractor* forms the opinion that the slippage in schedule reported in paragraph 3.5.1.4 cannot be recovered by the *Contractor,* it shall, in the same notice provided under paragraph 3.5.1.4, 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.

8.2 Add new paragraph 3.5.2 as follows:

3.5.2 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.

9. GC 3.6 SUPERVISION

9.1 Delete paragraph 3.6.1 in its entirety and substitute new paragraph 3.6.1 as follows:

3.6.1 The *Contractor* shall provide all necessary supervision and appoint competent representatives indicated at the time of submission/interview who shall be in attendance at the *Place of the Work* while work is being performed. Should the *Contractor*'s Supervisor or Project Manager prove for valid reasons to be unacceptable to the *Owner*, the *Owner* shall give written notice to the *Contractor* who shall within 7 days of receipt of same provide a suitable replacement acceptable to the *Owner*. The appointed representatives shall not be changed except for valid reasons, and upon the *Contractor* obtaining the *Owner's* written consent, which consent will not be unreasonably withheld.

9.2 Add new paragraph 3.6.3 as follows:

3.6.3 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.

10. GC 3.7 SUBCONTRACTORS AND SUPPLIERS

10.1 Delete paragraph 3.7.2 in its entirety and substitute new paragraph 3.7.2 as follows:

3.7.2 The *Contractor* agrees not to change *Subcontractors* without prior written approval of the *Owner,* which approval will not be unreasonably withheld.

10.2 Add new paragraph as follows:

3.7.7 Where provided in the *Contract*, the *Owner* may assign to the *Contractor*, and the *Contractor* agrees to accept, any contract procured by the *Owner* for work or services required on the *Project* that has been pre-bid or pre-negotiated by the *Owner*.

11. GC 3.8 LABOUR AND PRODUCTS

11.1 Add new sentence to the end of paragraph 3.8.2 as follows:

"The *Contractor* represents and warrants that the *Products* provided for in accordance with the *Contract* are not subject to any conditional sales contract and are not subject to any security rights obtained by any third party which may subject any of the *Products* to seizure and/or removal from the *Place of the Work*."

11.2 Add new sentence to the end of paragraph 3.8.3 as follows:

"The foreperson of each trade engaged on the *Work* must be able to speak and understand the English language sufficiently well to comprehend and carry out all instructions issued and to work in complete

coordination with other trades."

11.3 Add new paragraph 3.8.4 as follows:

3.8.4 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.*

12. GC 3.9 DOCUMENTS AT THE SITE

12.1 Delete paragraph 3.9.1 in its entirety and substitute new paragraph 3.9.1 as follows:

3.9.1 The *Contractor* shall keep one copy of the current *Contract Documents, Supplemental Instructions,* Contemplated *Change Orders, Change Orders, Change Directives,* reviewed *Shop Drawings, Submittals,* approved construction schedule*,* as-built drawings, reports and records of meetings at the *Place of the Work,* in good order and available to the *Owner* and *Consultant.*

13. GC 3.10 SHOP DRAWINGS

13.1 Add the words "AND OTHER SUBMITTALS " to the Title after SHOP DRAWINGS.

13.2 Add "and *Submittals"* after the words *"Shop Drawings"* in clauses 3.10.2, 3.10.4, 3.10.5, 3.10.7, 3.10.8, 3.10.8.2, 3.10.9, 3.10.10, and 3.10.11.

13.3 Delete paragraph 3.10.3 in its entirety and substitute new paragraph 3.10.3 as follows:

3.10.3 Prior to the first application for payment, the *Contractor* and the *Consultant* shall jointly prepare a schedule of the dates for submission and return of *Shop Drawings* and any other *Submittals.*

13.4 Add new sentence to the end of paragraph 3.10.6 as follows:

"Where the *Consultant*'s shop drawing review stamp is affixed to any one page, drawing or sheet in a submission for a *Product* or process, it shall be deemed to apply to all pages, drawings or sheets in the submission for the *Product* or process."

13.5 Delete subparagraph 3.10.8.1 in its entirety and substitute new subparagraph 3.10.8.1 as follows:

3.10.8.1 the *Contractor* has determined and correlated all of the required field measurements with the *Shop Drawings* and any *Submittals* and field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so if not possible at the time of the review, and

13.6 Delete paragraph 3.10.12 in its entirety and substitute new paragraph 3.10.12 as follows:

3.10.12 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, 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.*

13.7 Add new paragraphs 3.10.13, 3.10.14, 3.10.15, 3.10.16, 3.10.17 and 3.10.18 as follows:

3.10.13 *Contractor* shall secure, from all his Subcontractors and material suppliers, uniform size *Shop Drawings* of all items, as listed in their respective trade specifications, showing construction materials, etc., or as required, and upon which representative trade bids have been based.

3.10.14 *Shop Drawings* shall define divisions of responsibility between Trades, and all items shown on *Shop Drawings* shall be supplied as part of the *Contract* unless it is specifically approved that certain items are not part of the *Contract*.

3.10.15 *Shop Drawings* shall be laid out with same orientation as *Contract Document*s.

3.10.16 Submit digital copy of *Shop Drawings*. Provide a 75 x 180 mm blank space for the *Consultant's* use. Upon receipt of these copies, the *Consultant* will review, mark corrections or changes, and digitally return to the *Contractor*. *Shop drawings* shall be corrected and resubmitted for the *Consultant's* further review and further revision if necessary. *Shop drawings* will be digitally returned to *Contractor* for reproduction. All fixture cuts, equipment brochures and printed descriptive literature shall be digitally submitted.

3.10.17 Upon completion of review by *Consultant*, *Shop Drawings* and other *Submittal*s will be returned to the *Contractor* for reproduction and issuance to all concerned. Retain one complete set of all reviewed *Shop Drawings* and other *Submittals* for *Owner* which shall, on completion of the work, be issued to the *Owner* in an approved form.

3.10.18 Any fabrication work done before receiving final reviewed *Shop Drawings* and other *Submittals* shall be at the *Contractor*'s and his Subcontractor's and/or supplier's risk."

14. GC 3.11 USE OF THE WORK

14.1 Add new sentence to the end of paragraph 3.11.2 as follows:

The Contractor shall undertake the implementation of procedures and practices to review, at least on a weekly basis, the proposed loading of any part of the *Work* to ensure that the proposed weight or force of the load will not endanger the safety of the *Work* or the Workers.

14.2 Add new paragraph 3.11.3 as follows:

3.11.3 The *Owner* shall have the right to use and occupy the *Place of the Work*, including but not limited to the building and site in accordance with other provisions of the *Contract Document*s. Such use and occupation shall not be considered acceptance of the *Work*, nor shall such use and occupation in any way relieve the *Contractor* from his responsibility to complete the *Contract*. Such use shall not be considered an act or omission by the *Owner* causing delay in GC 6.5 Delays, and the *Contractor* is responsible for coordinating the *Work* to suit such use and occupancy, as may be further required in the *Contract Document*s."

15. GC 3.12 CUTTING AND REMEDIAL WORK

15.1 Add new sentence to the end of paragraph 3.12.4 as follows:

The *Contractor* and the specialist shall review all proposed procedures for cutting and remedial work with the *Consultant* prior to undertaking the cutting.

16. GC 3.13 CLEANUP

16.1 Add new paragraph 3.13.4 as follows:

3.13.4 The *Contractor* shall undertake the implementation of a schedule of procedures and practices to ensure that the *Place of the Work* is kept in a safe, tidy and clean condition.

Add new General Condition 3.14 as follows:

17. GC 3.14 PERFORMANCE BY CONTRACTOR

3.14.1 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.*

3.14.2 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.*

18. LIMIT OF LIABILITY

18.1 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; as outlined in the *Bid section 00 61 00 of the contract requirements.*

18.2 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 sum of ***Ten-Thousand*** **Dollars** ($ ***10,000.00)*** and the reasonable cost to the bidder of preparing its bid.

19. GC 4.1 CASH ALLOWANCES

19.1 Delete the last sentence in paragraph 4.1.4 in its entirety and substitute a new sentence as follows:

Where costs under a cash allowance exceed the amount of the allowance, unexpended amounts from other cash allowances shall be reallocated at the *Consultant's* direction to cover the shortfall.

19.2 Delete paragraph 4.1.5 in its entirety and substitute new paragraph 4.1.5 as follows:

4.1.5 The unexpended total cash allowance amount shall be deducted from the *Contract Price* by *Change Order.*

19.3 Delete paragraph 4.1.7 in its entirety and substitute new paragraph 4.1.7:

4.1.7 At the commencement of the work, the *Contractor* shall prepare for the review and acceptance of the *Owner* and the *Consultant*, a schedule indicating the times, within the construction schedule referred to in GC 3.5, that items called for under cash allowances and items that are specified to be *Owner* purchased and *Contractor* installed or hooked up are required at the site to avoid delaying the progress of the *Work*.

19.4 Add new paragraph 4.1.8 as follows:

4.1.8 The *Owner* or the *Contractor* shall call for competitive bids for portions of the *Work, to* be paid

for from cash allowances.

20. GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

20.1 Revise the heading, "GC **5.1 FINANCING INFORMATION REQUIRED OF THE OWNER"** to read, **"GC 5.1 FINANCING INFORMATION REQUIRED".**

20.2 Delete paragraph 5. 1.1 in its entirety and substitute new paragraph 5.1.1 as follows:

5.1.1 The *Owner* and *Contractor* shall provide each other with timely *Notice in Writing* of any material change in their financial ability to fulfill their respective obligations under the *Contract.*

20.3 Delete paragraph 5.1.2 in its entirety.

21. GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

21.1 Add to the end of paragraph 5.2.1 the following new sentence:

"subject to such limitations and conditions as may be otherwise indicated."

21.2 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."

21.3 Add new paragraphs 5.2.8, 5.2.9, 5.2.10 and 5.2.11 as follow:

5.2.8 The *Contractor* shall submit, with each application for progress payment after the first, a Statutory Declaration, on an ***original*** form of CCDC Document 9A-2001, stating that payments in connection with the *Work,* as noted in the Statutory Declaration, have been made to the end of the period immediately preceding that covered by the current application.

5.2.9 The *Contractor* shall submit Workplace Safety & Insurance Board Clearance Certificate, with each application for progress payment.

5.2.10 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.

5.2.11 As required by paragraph 3.5.1.4, the *Contractor* shall prepare and submit with each application for progress payment, an updated construction schedule.

22. GC 5.3 PROGRESS PAYMENT

22.1 Delete from the first line of subparagraph 5.3.1.2, the words, "calendar days" and substitute the following words:

"Working Days".

22.2 Delete subparagraph 5.3.1.3 in its entirety and substitute new subparagraph 5.3.1.3 as follows:

5.3.1.3 The *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT no later than 15 *Working Days* after the date of a certificate of

payment issued by the *Consultant,* or where no Certificate for Payment is issued not later than 14 *Working Days* after the *Owner* deems the invoice acceptable.

22.3 Add new paragraph 5.3.2 as follows:

Notwithstanding any provisions in the *Contract Documents* to the contrary, the *Owner* shall be entitled to deduct from any payment to the *Contractor* an amount equal to the value, as determined by the *Consultant* in the first instance, of any claim, deficiency in the *Work*, or other significant risk that the *Owner* faces due to the failure of the *Contractor* to perform any material obligations under the *Contract*."

23. GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

23.1 Delete paragraph 5.4.3 in its entirety and substitute new paragraph 5.4.3 as follow:

5.4.3 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.

23.2 Add new paragraph 5.4.4, 5.4.5, 5.4.6 and 5.4.7 as follows:

5.4.4 The *Contractor* shall publish, in a construction trade newspaper in the area of the location of the *Work,* 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.

5.4.5 Prior to submitting its application for *Last Certification for Payment,* 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 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 performed in conformance with the requirements of municipal, government and utilities authorities having jurisdiction.

5.4.6 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.

5.4.7 Notwithstanding paragraph 5.4.1, and with the prior consent of the *Owner*, and as may be described in the *Contract Documents*, the *Contractor* may elect to waive application for a Certificate of Substantial Performance and proceed to Completion of Contract as defined in applicable lien legislation.

24. GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

24.1 Add new subparagraphs 5.5.1.3, 5.5.1.4 and 5.5.1.5 as follow:

5.5.1.3 submit a declaration that no written notices of lien have been received by it.

5.5.1.4 submit a Statutory Declaration CCDC 9A-2001.

5.5.1.5 submit Workplace Safety & Insurance Board Clearance Certificate.

24.2 Delete from line 1 of paragraph 5.5.2, the words, "the statement" and substitute the following words:

"the documents".

24.3 Delete paragraph 5.5.3 in its entirety.

25. GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

25.1 Delete Article GC 5.6 in its entirety.

26. GC 5.7 FINAL PAYMENT

26.1 Delete paragraph 5.7.1 in its entirety and substitute new paragraph 5.7. 1 as follows:

5.7.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment within 60 days of the Completion of the *Contract* within the meaning of the Construction Lien Act (Ontario). Failure to submit the invoice within the specified time frame voids *Owner's* obligation to pay invoice 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, a sufficient amount as* security for the obligation of the *Contractor* to deliver the undelivered documents.

26.2 Delete from the first line of paragraph 5.7.2 the words, "calendar days" and substitute the following words:

"Working Days".

26.3 Delete from the second line of paragraph 5.7.4 the words, "calendar days" and substitute the following words:

"Working Days".

26.4 Add new paragraph 5.7.5 and 5.7.6 as follows:

5.7.5 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.

5.7.6 The release of the remaining Holdback monies shall become due and payable on the day following the expiration of the statutory limitation period stipulated in the lien legislation applicable to the *Place of the Work* providing that the *Owner* may retain out of such Holdback monies any sums required by law to satisfy any liens against the *Work* or monetary claims against the *Contractor* and enforceable against the *Owner*, and providing that the *Contractor* has submitted to the *Owner* a sworn statement that all accounts for labour, subcontracts, products, construction machinery and equipment and other indebtedness which may have been

incurred by the *Contractor* in the performance of the *Work*, and for which the *Owner* might in any way be held responsible, have been paid in full, except Holdback monies properly retained.

27. GC 5.8 WITHHOLDING OF PAYMENT

27.1 Add new paragraphs 5.8.2, 5.8.3 and 5.8.4 as follows:

5.8.2 The *Owner* may retain from any amounts otherwise payable to the *Contractor* under this *Contract* an amount sufficient to satisfy any claims made by third parties arising out of the *Contractor*'s performance of the *Work*, or of the performance of others for whom the *Contractor* is responsible in law, including, without limiting the foregoing, amounts sufficient to satisfy court judgments or arbitration awards.

5.8.3 The *Owner* may retain from any amounts otherwise payable to the *Contractor* under this *Contract* an amount sufficient to satisfy bona fide claims of the *Owner*, including, without limiting the foregoing, the amount of any additional costs incurred by the *Owner* arising from the *Contractor's* failure to perform its contractual obligations under the *Contract*.

5.8.4 The withholding or retention of funds by the *Owner* under this GC 5.8 - WITHHOLDING OF PAYMENT shall not constitute grounds under GC 7.2 - CONTRACTOR'S RIGHT TO THE STOP WORK OR TERMINATE THE CONTRACT for declaring the *Owner* in default, but shall be subject to the provisions of the lien legislation applicable to the *Place of the Work*."

28. Add new General Condition 5.10 as follows:

GC 5.10 CONSTRUCTION LIENS

5.10.1 Provided the *Owner* is not in default of its payment obligations under the *Contract* and notwithstanding anything else in this PART 5 PAYMENT, in the event a claim for lien is registered against the *Project* lands, or the *Owner* receives any written notice of lien, the *Owner* shall be entitled to withhold any payment otherwise due to the *Contractor* until such time as such claims have been dealt with as provided below.

5.10.2 In the event that a written notice of a lien from the performance of the *Work* is received by the *Owner*, the *Contractor* shall, within 10 calendar days, at its sole expense, arrange for the withdrawal or other disposal of the written notice of a lien pursuant to the Construction Lien Act (Ontario).

5.10.3 If a construction lien arising from the performance of the *Work* is registered against the *Project* lands, the *Contractor* shall, within 10 calendar days, at its expense, vacate or discharge the lien from title to the *Project* lands. If the lien is merely vacated, the *Contractor* shall, if requested, undertake the *Owner*'s defense of any subsequent action commenced in respect of the lien at the *Contractor*'s expense.

5.10.4 If the *Contractor* fails or refuses to vacate or discharge a construction lien or written notice of lien within the time prescribed above, the *Owner* shall, at its option, be entitled to take all steps necessary to vacate and/or discharge the lien, and all costs incurred by the *Owner* in doing so (including, without limitation, legal fees on a solicitor and his own client basis and any payment which may ultimately be made out of or pursuant to security posted to vacate the lien) shall be for the account of the *Contractor*, and the *Owner* may deduct such amounts from the amounts otherwise due or owing to the *Contractor*.

5.10.5 Without limiting any of the foregoing, the *Contractor* shall satisfy all judgments and pay all costs resulting from any construction liens or any actions brought in connection with any liens, or in connection with any other claim or lawsuit brought against the *Owner* by any person that provided services or materials to the *Project* lands which constituted part of the *Work*, and the *Contractor* shall indemnify the *Owner* for any and all costs (including, without limitation, legal fees on a solicitor and client basis) the *Owner* may incur in connection with such claims or actions.

5.10.6 This GC 5.10 – CONSTRUCTION LIENS does not apply to construction liens claimed by the *Contractor*."

29. GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

29.1 Add the following sentences to the end of paragraph 6.1.2:

This requirement is of the essence and it is the express intention of the parties that any claims by the *Contractor* for a change in the *Contract Price* and/or *Contract Time* shall be barred unless there has been strict compliance with PART 6 CHANGES IN THE WORK. No course of conduct or dealing between the parties, no express or implied acceptance of alterations or additions to the *Work* and no claims that the *Owner* has been unjustly enriched by any alteration or addition to the *Work*, whether in fact there is any such unjust enrichment or not, shall be the basis of a claim for additional payment under this *Contract* or a claim for any extension of the *Contract Time*.

29.2 Add new paragraph 6.1.3 as follows:

6.1.3 The *Contractor* shall perform the work for any and all changes to the standards prescribed in the *Contract* including quality of workmanship in a safe manner.

30. GC 6.3 CHANGE DIRECTIVE

30.1 Delete 6.3.7.1(1) and replace it with the following:

(1) carrying out the work, including necessary supervisory services;

30.2 Delete paragraph 6.3.7.1(2) and replace it with the following:

(2) intentionally left blank.

30.3 Amend paragraph 6.3.7.1(3) so that, as amended, it reads:

(3) engaged in the preparation of *Shop Drawings,* fabrication drawings, coordination drawings and project record drawings: or...

30.4 Amend paragraph 6.3.7.1(4) so that, as amended, it reads:

(4) including all professionals and clerical staff engaged in processing changes in the Work.

30.5 Add the following sentences to the end of paragraph 6.3.7:

6.3.7.18 other factors as may be specified;

6.3.7.19 The procedures of evaluation including applicable overhead and profit mark-up provisions shall be as described under 6.2 CHANGE ORDER and the specifications."

31. GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

31.1 Add new subparagraph 6.4.5 as follows:

6.4.5 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.

32. GC 6.5 DELAYS

32.1 Delete the period at the end of paragraph 6.5.1, and substitute the following words:

, but excluding any consequential, indirect or special damages.

32.2 Delete the period at the end of paragraph 6.5.2, and substitute the following words:

, but excluding any consequential, indirect or special damages.

32.3 Add new paragraphs 6.5.6. and 6.5.7 as follows:

6.5.6 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* may be extended for such reasonable time as the *Consultant* may decide in consultation with the *Owner.* As a condition to the *Owner's* agreement to extend the *Contract Time,* 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* fro the *Consultant* 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.*

6.5.7. The *Contractor* shall be responsible for the care, maintenance and protection of the *Work*, in the event of a suspension or delay in the performance of the *Work*, regardless of the reason for such suspension of delay. In the event the delay or suspension was not the fault of the *Contractor*, the *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such care, maintenance and protection of the *Work.*

33. GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

33.1 Add to the end of paragraph 7.1.1, the following new words:

without affecting in any respect the liability of the *Contractor* in respect of earlier defaults.

33.2 Add to paragraph 7.1.2, after the word "properly", the following new words:

or fails or neglects to maintain the latest approved schedule provided pursuant to GC3.5

33.3 Delete the words "to a substantial degree" from paragraph 7.1.2.

33.4 Add to paragraph 7.1.3.1 after the word "commences" the words:

and is diligently proceeding with.

33.5 Delete in paragraph 7.1.3.2 the words "provides the *Owner* with an acceptable schedule for such correction, and" and insert the words "provides a schedule acceptable to the *Owner* for such correction, and".

34. GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

34.1 Delete subparagraph 7.2.3.1 in its entirety.

34.2 Delete subparagraph 7.2.3.3 in its entirety and substitute new subparagraph 7.2.3.3 as follows:

7.2.3.3 the *Owner* fails to pay the *Contractor* when due the amount certified by the *Consultant* or awarded by arbitration or a Court, except where the *Owner* has a bona fide claim for set off, or

34.3 Delete from line 2 of subparagraph 7.2.3.4, the words, "OF THE OWNER".

34.4 Add new subparagraph 7.2.3.5 as follows:

The foregoing default shall not apply to the proper withholding of payment as provided for under the *Contract*, including the *Contractor*'s failure to promptly pay previously valid claims or because of registration or notice of liens against the *Owner*'s property, until such claims and liens are discharged. The foregoing default shall not apply to the withholding of funds for setoff under GC 5.8.2.

34.5 Delete from the second line of paragraph 7.2.4 the words, "5 *Working Days*" and substitute the following words:

*"*15 *Working Days".*

34.6 Add new paragraph 7.2.6 as follows:

7.2.6 If the *Contractor* terminates the *Contract* under the conditions described in this GC 7.2, the *Contractor* shall be entitled to be paid for all work performed to the date of termination. The *Contractor* shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization, losses sustained on *Products* and construction machinery and equipment but in no event shall the Contractor be entitled to receive nor shall the Owner be required to pay, indirect, special or consequential damages including, without limitation, loss of overhead and profit, as a result of the termination.

35. GC 8.1 AUTHORITY OF THE CONSULTANT

35.1 Add in the first line of paragraph 8.1.3, the word “written” before the word “instructions”.

35.2 Delete last sentence of 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.*

36. GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

36.l Delete from the sixth line of paragraph 8.2.2 the words, "10 *Working Days*" and substitute the following words:

*"*15 *Working Days".*

36.2 Delete from the first line of paragraph 8.2.4 the words, "10 *Working Days*" and substitute the following words:

*"*15 *Working Days".*

36.3 Add new paragraphs 8.2.9, 8.2.10, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.215 and 8.2.16 as follow:

8.2.9 Within 5 *Working Days* of receipt of the notice of arbitration by the responding party under paragraph 8.2.6, the *Owner* and the *Contractor* shall give the *Consultant* a written notice containing:

.1 a copy of the notice of arbitration
.2 a copy of supplementary conditions 8.2.9 to 8.2.16 of the *Contract,* and;
.3 any claims or issues which the *Contractor* or the *Owner,* as the case may be, wishes to raise in relation to the *Consultant* arising out of the issues in dispute in the arbitration.

8.2.10 The *Owner* and the *Contractor* agree that the *Consultant* may elect, within ten *Working Days* of receipt of the notice under paragraph 8.2.9, to become a full party to the arbitration under paragraph 8.2.6 if the *Consultant:*
.1 has a vested or contingent financial interest in the outcome of the arbitration;
.2 gives the notice of election to the *Owner* and the *Contractor* before the arbitrator is appointed;
.3 agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.2.6; and,
.4 agrees to be bound by the arbitrate award made in the arbitration.

8.2.11 If the *Consultant* is not given the written notice required under paragraph 8.2.10, both the *Owner* and the *Contractor* are estopped from pursuing an action, counter claim or other proceeding or making an application against the *Consultant* arising out of the issues in dispute in the arbitration between the *Owner* and the *Contractor* under paragraph 8.2.6."

8.2.12 If an election is made under paragraph 8.2.10, the Consultant may participate in the appointment of the arbitrator and notwithstanding the rules referred to in paragraph 8.2.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the Owner receives a copy of the notice of arbitration.

8.2.13 The arbitrator in the arbitration in which the *Consultant* has elected under paragraph 8.2.10 to become a full party may:
.1 on application of the *Owner* or the *Contractor,* determine whether the *Consultant* has satisfied the requirements of paragraph 8.2.10; and
.2 make any procedural order considered necessary to facilitate the addition of the *Consultant* as a party to the arbitration.

8.2.14 The provisions of paragraph 8.2.9 shall apply mutatis mutandis to written notice to be given by the *Consultant* to any sub-consultant.

8.2.15 In the event of notice of arbitration given by a *Consultant* to a sub-consultant, the sub-consultant is not entitled to any election with respect to the proceeding as outlined in 8.2.10, and is deemed to be bound by the arbitration proceeding.

8.2.16 The cost of arbitration shall be apportioned against the parties hereto or against any one of them as the arbitrator may decide, as outlined in the latest edition of the Rules for Mediation of CCDC 2 Construction Disputes, except that those costs shall not include counsel fees for any of the parities to the arbitration. Counsel fees shall be paid by each party.

37. GC 8.3 RETENTION OF RIGHTS

37.1 Add new paragraph 8.3.3 as follows:

8.3.3 If the *Owner* gives the notice in writing described in paragraph 8.2.6 to have a dispute resolved by arbitration, the *Contractor* agrees that this paragraph 8.3.3 shall be construed as a formal consent to the stay of any lien proceedings until an award is rendered in the arbitration or such dispute is otherwise resolved between the parties. In no event shall the *Contractor* be deprived of its right to enforce its lien against the *Project* should the *Owner* fail to satisfy any arbitral award against it in full on the dispute in respect of which the lien proceedings were commenced. Nothing in this paragraph 8.3.3 shall prevent the *Contractor*

from taking the steps required by the *Construction Lien Act* to preserve and/or perfect a lien to which it may be entitled.

38. GC 9.1 PROTECTION OF WORK AND PROPERTY

38.1 Delete subparagraph 9.1.1.1 in its entirety and substitute new subparagraph as follows:

9.1.1.1 errors in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraph 3.14,1;

38.2 Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2 as follows:

9.1.2 Before commencing any work, the *Contractor* shall determine the locations of all underground utilities and structures indicated in the *Contract Documents* or that are discoverable by applying to inspection of the *Place of the Work* the degree of care and skill described in paragraph 3.14.1.

38.3 Add new paragraph 9.1.5 as follows:

9.1.5 The *Contractor* shall neither undertake to repair and/or replace any damage whatsoever to the work of other contractors, or to adjoining property, nor acknowledge the same was caused or occasioned by the *Contractor,* without first consulting the *Owner* and receiving written instructions as to the course of action to be followed from either the *Owner* or the *Consultant.* However, where there is danger to life or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger.

39. GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

39.1 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 n 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,

39.2 Add “and the Consultant” after “Contractor” in subparagraph 9.2.7.4.

39.3 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.

40. GC 9.4 CONSTRUCTION SAFETY

40.1 Delete paragraph 9.4.1 in its entirety and substitute new paragraph 9.4.1 as follows:

9.4.1 The *Contractor* shall be the “constructor” within the meaning of OHSA and 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.*

40.2 Add new paragraphs 9.4.2, 9.4.3 and 9.4.4 as follow:

9.4.2 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 OHSA.

9.4.3 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 OHSA, including the payment of legal fees and disbursements on a full indemnity 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.

9.4.4 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.

41. GC 9.5 MOULD

41.1 Delete paragraph 9.5.3.3 in its entirety and substitute new paragraph 9.5.3.3 as follows:

9.5.3.3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor.* in the opinion of the *Consultant,* the *Contractor* has been delayed in performing the *Work* and / or has incurred additional costs under paragraph 9.5.1.2, the *Owner* shall reimburse the *Contractor* for reasonable costs incurred as a result of the delay and as a result of taking those steps, and"

41.2 Add "and the Consultant" after "Contractor" in subparagraph 9.5.3.4.

42. GC 10.1 TAXES AND DUTIES

42.1 Add to the end of paragraph 10.1.2 the following words:

", except for changes announced prior to the time of the bid closing, that are to take effect at some time thereafter, shall be deemed to have been taken into account in the *Contract Price*. The *Contractor* shall furnish to the *Owner* such information concerning its acquisition of equipment, inventory and other materials to enable the *Owner* to accurately access effect upon the *Contractor* of such change in tax or duty.

42.2 Add new paragraphs 10.1.3 and 10.1.4 as follows:

10.1.3 The *Contractor* is not entitled to any mark-up for profit, overhead or otherwise, due to an increase in taxes or duties. The *Contractor* shall be entitled to claim for the increase in cost equal to the amount of the tax and/or duty on the uncompleted cost of the work. The *Owner* will be entitled to withhold payment to the *Contractor* a sum equal to the amount of tax and/or duty reduction on the uncompleted portion of the work.

10.1.4 Where the *Owner* is entitled to an exemption or a recovery of sales taxes, customs duties, excise taxes or *Value Added Taxes* applicable to the *Contract,* the *Contractor* shall, at the request of the *Owner* or the *Owner's* representative, assist with application for any exemption, recovery or refund of all such taxes and duties and all amounts recovered or exemptions obtained shall be for the sole benefit of the *Owner.* The *Contractor* agrees to endorse over to

the *Owner* any cheques received from the federal or provincial governments, or any other taxing authority, as may be required to give effect to this paragraph

43. GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

43.1 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, 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."

43.2 Delete from the first line of paragraph 10.2.5 the word, "The" and substitute the following words:

"Subject to paragraph 3.4.1, the".

44. GC 11.1 INSURANCE

44.1 Delete from the first sentence of paragraph 11.1.1, the following:

“the minimum requirements of which are specified in CCDC 41 – CCDC Insurance Requirements in effect at the time of bid closing except as hereinafter provided:”

44.2 Add to the end of subparagraph 11.1.1.1, the following words:

“General liability insurance shall be with limits of not less than $2,000,000 per occurrence, an aggregate limit of not less than $2,000,000 within any policy year with respect to completed operations and a deductible not to exceed $5,000. The insurance coverage shall not be less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320. To achieve the desired limit, umbrella or excess liability insurance may be used.”

44.3 Add to the end of subparagraph 11.1.1.2, the following words:

“Automobile liability insurance in respect of vehicles that are required by law to be insured under a contract by a Motor Vehicle Liability Policy, shall have limits of not less than $2,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof covering all vehicles owned for leased by the *Contractor*. Where the policy has been issued pursuant to a government operated automobile insurance system, the *Contractor* shall provide the *Owner* with confirmation of automobile insurance coverage for all automobiles registered in the name of the *Contractor*.

44.4 Not Used

44.5 Delete paragraph 11.1.1.4 and replace with the following:

44.6 Add to the end of subparagraph 11.1.1.7, the following words:

“Broad Form” contractors’ equipment insurance coverage covering *Construction Equipment* used by the *Contractor* for the performance of the Work, shall be in a form acceptable to the *Owner* and shall not allow subrogation claims by the Insurer against the *Owner*.

44.7 Delete the word “property” in all instances.

44.8 Add to the end of subparagraph 11.1.1.6, the following words:

“Broad Form” contractors’ equipment insurance coverage covering *Construction Equipment* used by the

Contractor for the performance of the Work, shall be in a form acceptable to the *Owner* and shall not allow subrogation claims by the Insurer against the *Owner*.

44.9 Delete paragraphs 11.1.6 and 11.1.7 in their entirety.

44.10 Delete paragraph 11.1.8 and substitute the following:
"A *Change Directive* shall not be used to direct a change in the insurance requirements to be provided by the *Contractor*."

45. GC 11.2 CONTRACT SECURITY

45.1 Add to the end of paragraph 11.2.1, the following words:

"guarantee the faithful performance of the *Contract* in accordance with the *Contract Documents*. The performance bond shall cover all extended warranty periods specified in GC 12.3. The Labour and Material Payment Bond shall ensure payment of wages and products to Subcontractors and suppliers, and discharge of liens and debts, including commitments in law, such as Employment Insurance, Income Tax Deductions, Workplace Safety and Insurance Board premiums and Vacation Pay."

45.2 Add new paragraphs 11.2.3, 11.2.4, 11.2.5, and11.2.6 as follows:

11.2.3 The *Contractor* and not the *Owner* shall be responsible for notifying the surety company of any changes made to the *Contract* during the course of construction.

11.2.4 Obligations incurred in the event of the *Contractor*'s default shall include, but not necessarily be limited to the following:

11.2.4.1 The payment of all legal, accounting, architectural, engineering and consulting fees incurred by the *Owner* in determining the extent of the *Work* executed and any additional work required as a result of the interruption of the *Work*, and

11.2.4.2 The payment of additional expenses by the *Owner* in the form of security, light, heat, power, etc. during the period between the default of the *Contractor* and the commencement of the work.

11.2.5 Without limiting the foregoing in any way, the Performance Bond shall indemnify and hold harmless the *Owner* for and against any and all costs and expenses (including all legal and professional fees and court costs) arising out of or as a result of or as a consequence of any default of the *Contractor* under the *Contract*."

11.2.6 The Performance Bond shall remain in effect for the duration of the warranty period as specified in GC 12.3, or as may be amended by these Supplementary Conditions.

46. GC 12.1 INDEMNIFICATION

46.1 Add new paragraph 12.1.7 as follows:

12.1.7 The Contractor shall indemnify and hold harmless the Consultant, its agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings by third parties that arise out of, or are attributable to, the Contractor's performance of the Contract, provided such claims are attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property, and caused by negligent acts or omissions of the Contractor or anyone for whose acts the Contractor may be liable, and made in writing within a period of 6 years from the date of Substantial Performance of the Work as set out in the certificate of Substantial Performance of the Work, or within such shorter such period as may be prescribed by any limitation statute or the province or territory of the Place of Work"."

47. GC 12.2 WAIVER OF CLAIMS

47.1 Delete the last sentence of subparagraph 12.2.3.4 and substitute the following:

For purposes of this subparagraph 12.2.3.4, "substantial defects or deficiencies" means those defects or deficiencies in the *Work* where the reasonable cost of repair of such defects or deficiencies exceeds:

.1 if the *Contract Price* is $2 million or less, the sum of $50,000, before Value Added Tax;

.2 if the *Contract Price* exceeds $2 million, the sum of $100,000, before Value Added Tax.

In any event, "substantial defects or deficiencies" shall include defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents.*

48. GC 12.3 WARRANTY

48.1 Delete from the first line of paragraph 12.3.2 the word, "The" and substitute the following words:

"Subject to paragraph 3.4.1, the...

49. Add new PART 13 as follows:

PART 13 OTHER PROVISIONS

GC 13.1 OWNERSHIP OF MATERIALS

13.1.1 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.*

GC 13.2 CONTRACTOR DISCHARGE OF LIABILITIES

13.2.1 In addition to the obligations assumed by the *Contractor* pursuant to GC 3.7, the *Contractor* agrees to discharge all liabilities incurred by it for labour, materials, services, *Subcontractors* and *Products,* used or reasonably required for use in the performance of the *Work,* except for amounts withheld by reason of legitimate dispute which have been identified to the party or parties, from whom payment has been withheld.

GC 13.3 RECORD DRAWINGS

13.3.1 As provided in the *Contract Documents,* the *Contractor* shall prepare record *Drawings* and specifications and provide them to the *Consultant* for review.

GC 13.4 DAILY REPORTS/DAILY LOGS

13.4.1 The *Contractor* shall cause its supervisor, or such competent person as it may delegate, 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.

13.4.2 The *Contractor* shall also maintain records, either at its head office or at the job site, recording manpower and material resourcing on the *Project,* including records which document the activities of the *Contractor* in connection with GC 3.5, and comparing that resourcing to the resourcing anticipated when the most recent version of the schedule was prepared pursuant to GC 3.5.

GC 13.5 NEUTRAL APPOINTING AUTHORITY

13.5.1 For purposes of the Rules for Mediation and Arbitration of Construction Disputes CCDC 40, the term "neutral appointing authority", as used in both the Rules for Mediation of CCDC 2 Construction Disputes and the Rules for Arbitration of CCDC 2 Construction Disputes shall mean the head of the construction section of the ADR Institute of Ontario, Inc. presiding at the time notice of the dispute is given pursuant to the *Contract.*

GC 13.6 HUMAN RIGHTS AND SEXUAL AND GENDER HARASSMENT POLICIES

13.6.1 The parties agree to be governed by the provisions of the Ontario Human Rights Code. Furthermore, the parties agree to comply with the provisions of the Client's Human Rights Policy and any subsequent related policy or procedures that the Client may approve. Refer to www.uoguelph.ca/hre/hr.shtml for more information.

GC13.7 ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT (AODA)

13.7.1 The parties agree to be governed by the provisions of the Accessibility for Ontarians with Disabilities Act (AODA).

13.7.2 The Contractor agrees to:

(a) comply with the accessibility standards established under the AODA by the Ontario Government and adhere to the University's policies and procedures in regards to accessibility as well as to ensure all of its subcontractors similarly do the same;
(b) ensure that training on the requirements of the accessibility standards are provided to those of its employees who will be working with the public (students, staff, faculty, visitors or other third parties) at, or on behalf of, the University and who participate in developing the proponent's policies, practices or procedures;
(c) keep records of such training;
(d) provide such records when required by the University; and
(e) upon Notice of Award, provide to the University with a signed AODA Supplier Compliance Form prior to commencing any work for the University.

END OF SECTION

1. General

1.1 Summary of Work

.1 Without limiting the scope of work, the Contract includes all products, labour, equipment, materials and temporary facilities as required, or implied by the drawings and specifications to complete the Work, complete with all necessary incidentals.

1.2 Related Sections

.1 Section 00 73 03 Supplementary Conditions.

.2 The requirements of this Section apply to all other Sections of the specifications.

1.3 Specification Format

.1 Specifications are not intended as a detailed description of installation methods but serve to indicate particular requirements to insure the performance of the completed work.

.2 Material shown or specified on Drawings or in Specifications, unless otherwise specified, shall conform to standards designated in Ontario Building Code. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards required by Ontario Building Code.

.3 Parts of specification are written in short form, therefore it is understood that where a component of Work is stated in heading followed by a material or operation, "shall be", "shall consist of" or similar words or phrases are implied which denote complete supply and installation of such material or operations for component of work designated by heading.

.4 Division One of the specifications shall be read into and form part of each Section of the Specifications.

.5 The Contract Documents are to be interpreted as a whole, although they are arranged in divisions and sections for convenience and clarity. The Contractor is responsible for all the work, regardless of the division of the work in the Contract Documents, and such division does not impose any obligation on the Consultant or upon the Owner as arbiters to establish limits or responsibility between the Contractor and the Subcontractors.

1.4 Quality of Work

.1 Work shall be of the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce required results.

.2 Do not employ any unfit persons or anyone unskilled in their required duties.

.3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant, whose decision is final.

.4 All contractor personnel are restricted to the job site and necessary access routes. No personnel shall visit other areas or buildings without specific authorization.

1.5 Allowances

.1 Refer to Section 01 21 01 Allowances

1.6 Available Documentation of Existing Building

.1 Refer also to Section 00 31 01 Information Available to Bidders.

.2 Partial drawings of the existing site and building, as applicable, are available for

review at the office of the Owner. Neither the Owner nor the Consultant represent or warranty that these drawings are complete or accurate, and these drawings are made available for information only.

.3 The Contractor remains solely liable for site verification of conditions.

1.7 Site Examination

.1 Contractor warrants that:

.1 the Contractor has visited and assessed the site prior to submitting a bid, including a review of any existing pertinent drawings and other documents and;

.2 that the Contractor and the subcontractors are familiar with all matters discussed at any bidder's site briefing, and;

.3 that the Contractor and the subcontractors are familiar with all visible, known or reasonably inferable site conditions.

.2 No claims for extra payment will be allowed for extra work made necessary or difficulties encountered due to conditions of the site which were visible upon or reasonably inferable from an examination of the site, and the Contract Documents prior to the closing of the bids. Execution of the form of Contract shall be deemed a waiver of all claims for extra payment due to any visible or reasonably inferable condition of the site existing prior to the closing of bids.

.3 The Contractor expressly agrees that conditions above existing suspended acoustic tile ceilings but below the level of plaster or gypsum board at the underside of structure shall be considered exposed conditions for the purposes of making findings under the provisions of this Contract, and that there shall be no claims for extra costs under CCDC 2 - 2008, GC 6 for extra work due to hidden conditions in these areas.

1.8 Owner's Use Of Premises

.1 The Owner reserves the right to maintain use of the building and site. All work shall be scheduled and co-ordinated to accommodate this requirement and all necessary precautions shall be taken to ensure safe occupancy. Coordinate use of premises under direction of Owner.

.2 Protect equipment, furnishings, Owner's and occupants' effects remaining in any area in which work is occurring as required, and as specified elsewhere. Make good all damage to the satisfaction of the Owner. Relocate all furnishings, equipment and effects remaining in rooms, as needed to execute the Work, and return same to original location before Owner re-occupies rooms or spaces.

.3 Take all measures necessary and as directed by the Owner to minimize disruption of the building, and its use by the Owner.

.4 Throughout the duration of the Work, maintain access for building and site users, occupants and others, who will use the building and site during the course of the Work. All work shall be scheduled and co-ordinated to accommodate this requirement and all necessary precautions shall be taken to ensure safe occupancy. Coordinate use of premises under direction of Owner and Consultant.

.5 Adjacent buildings and facilities may be occupied for Owner's uses and activities.

.6 Work carried out during Owner's standard operating hours shall not adversely affect the Owner's ongoing use and occupancy of the building, the site or adjacent buildings or facilities, otherwise work shall be carried out after hours, on weekends and holidays. Schedule work with the Owner to minimize disruption to Owner's operations. Contract Price includes all necessary overtime premium costs and cost to work statutory holidays, to ensure orderly progression of work and continuous operation of the Owner's facilities.

1.9 Restrictions on Contractor Movement

.1 Contractor personnel are restricted to the job site and necessary access routes. No personnel shall visit other areas or buildings without prior authorization. The extent of the work site shall be confined to the areas in which work is occurring and access routes to those areas.

1.10 Safety

.1 Refer to CCDC 2 – 2008, GC 9.4.

.2 Contractor's current health and safety statement and policy shall be filed with University of Guelph - Design, Engineering and Construction prior to start of work, for the Owner's information only.

.3 The health and safety statement and policy shall include:
- .1 Current Material Safety Data Sheets for the products to be used.
- .2 Provisions for safety including the use of continuous snow fencing in lieu of barricades or caution tape.
- .3 Signage to indicate DANGER ZONES, CLOSURES, DETOURS, ETC.
- .4 Set-up locations and procedures.
- .5 Material storage and handling.
- .6 Fire protection.
- .7 Debris handling, storage, disposal and clean-up.
- .8 Personnel safety required by the regulations including roof barriers, travel restraint systems and fall arrest systems.
- .9 Other measures pertinent to the Work.

.4 Owner's receipt of such policy is not approval of completeness and accuracy of policy, nor confirmation of compliance with applicable legislation. The Owner shall in no way be held liable for contents or enforcement of the Contractor's health and safety statement and policy, or the Contractor's detailed health and safety procedures. Owner's comments, or lack thereof, shall not be construed as approval of the Contractor's health and safety practices.

.5 Observe and enforce construction safety measures required by Ontario Building Code, Canadian Construction Safety Code 1977, Occupational Health and Safety Act 1980 and all latest amendments including the Regulations for Construction Projects, , Ontario Regulations 413/90 and all latest amendments, Workers' Compensation Board and municipal statutes and authorities.

.6 In the event of conflict between provisions of above authorities the most stringent provision applies.

.7 The General Contractor shall be designated the "Constructor", as defined by the Occupational Health and Safety Act. All Contractors on the Work site shall consider themselves as "employers" as defined by the Occupational Health and Safety Act.

.8 Do not permit any work in the existing building which may be hazardous or harmful to the occupants of the existing building. All such work must be scheduled for times the existing building will be unoccupied. Such work will include, but not be limited to, hoisting of materials and equipment over normally occupied spaces; the rise of toxic solvents or adhesives, the rise of carbon monoxide or carbon dioxide fumes generated by fuel-fired appliances or equipment, etc.

.9 Contractor is solely liable for construction safety and for compliance with applicable legislation.

.10 Provide a copy of the project registration filed with a Director under the Occupational Health and Safety Act (Ontario) called "Registration Forms of Construction and Employers of Workers".

.11 Where legislation requires a joint health and safety committee, provide minutes

of the committee's meetings to the Owner for the Owner's information.

.12 Provide Owner and Consultant with a copy of Ministry of Labour inspection report and any orders arising within 24 hours of receiving report, for Owner's information.

.13 Correct all safety deficiencies immediately.

.14 Accidents

.1 In addition to requirements of applicable legislation, in any emergency requiring the use of a resuscitator, the University Fire Prevention Office shall be notified.

.2 Make arrangements for emergency treatment of accidents.

.3 Provide Owner and Consultant with a copy of WSIB injury report for all reportable accidents and injuries, for information purposes, within 24 hours of incident.

.15 The Contractor will be responsible for verifying through locates the location of any utilities or services that cross or enter the area of the Work.

.16 Indemnify and hold harmless the Owner of any and all liability of every nature and description that may be suffered through bodily injuries, involving deaths of any persons, by reasons of negligence of the contractor, his agents, employees, or his sub-contractors.

1.11 Project Coordination

.1 Coordinate progress of the Work, progress schedules, submittals, use of site, temporary utilities, construction facilities, Owner's continuing use and occupancy of the building and site during the Work.

.2 Assume full responsibility for, and execute complete layout of work to locations, lines and elevations indicated including any existing utilities or services.

.3 Provide devices needed to lay out and construct work.

.4 Supply such devices as straight edges and templates required to facilitate Consultant's review of work.

.5 Each trade shall examine the work upon which the trade or specification Section depends. Have all defects and deficiencies corrected prior to proceeding with work. The application of work or any part of it shall be deemed acceptance by the Contractor of the work upon which subsequent work depends.

1.12 Cutting and Patching

Refer to Section 01 54 01 Cutting and Patching

1.13 Project Meetings

.1 Preconstruction Meeting

.1 Attend a preconstruction meeting before commencing work. Purpose of meeting is to review procedures.

.2 Submit, at this meeting, proof that application has been made to the Ministry of Labour for "Notice of Project" where legislation requires this notification be made. Work may not proceed until the Ministry has been notified.

.3 Record minutes. Include significant proceedings and decisions. Identify `action by' parties and critical dates.

.4 Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants, affected parties not in attendance, Consultant, and Owner.

.5 The Owner, the Consultant, all other consultants, the Contractor (including site superintendent(s) and project manager), commissioning authority, and

inspection and testing company will be in attendance.
.6 Agenda to include, but not be limited to, review of commissioning requirements and establishment of commissioning schedule. Refer also to Section 01 91 01 for commissioning requirements.

.2 Progress Meetings
.1 Schedule and administer project progress meetings before work begins, throughout progress of work, and at call of Consultant.
.2 Distribute written notice of each meeting four days in advance of meeting date to Consultant, Owner, and major subtrades involved in the Work. Subtrades who have work in progress or imminent at the time of the meeting shall attend project meetings.
.3 Provide physical space and make arrangements for meetings.
.4 Record minutes. Include significant proceedings and decisions. Identify `action by' parties and critical dates.
.5 Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants, affected parties not in attendance, Consultant, and Owner.
.6 Tracking documents:
.1 Contractor to prepare and bring to each progress meeting current copies of the following documents:
.1 RFI log.
.2 C.C.O., C.O., R.F.C.O. logs.
.3 Submittals logs.
.4 Schedule CD and CADA.
.5 S.I. log.
.6 Minutes of the previous progress meeting.
.2 The tracking documents specified above shall be provided for information purposes and shall not be subject to the review process specified under Section 01 33 01 unless otherwise directed by the Consultant, and an absence of comment on such tracking documents by the Consultant or the Owner shall not imply approval or acceptance of the logs so submitted.
.7 Attendees at progress meetings shall include the following:
.1 Contractor
.2 Contractor’s site superintendent(s)
.3 Consultant
.4 Owner
.5 Commissioning Authority
.6 Commissioning Agent (appointed by GC)
.7 Major Sub-trades including mechanical and electrical
.8 Agenda to include the following:
.1 Owner’s guidelines and policies.
.2 Review, approval of proceedings of previous meeting.
.3 Review of items arising from proceedings.
.4 Review of progress of the Work since previous meeting and Contractor’s monthly progress report.
.5 Field observations, problems, conflicts.
.6 Review and update critical path construction schedule.
.7 Problems that impede compliance with construction schedule.
.8 Review of off-site fabrication delivery schedules.
.9 Review material delivery dates/schedule.
.10 Corrective measures and procedures to regain construction schedule.
.11 Revisions to construction schedule.
.12 Progress, schedule, during subsequent period of the Work.
.13 Review submittal schedules.
.14 Review status of submittals.
.15 Maintenance of quality standards.
.16 Pending changes and substitutions.

.17 Review of Contract modifications and interpretations including, but not limited to: requests for interpretation and log, contemplated change orders, Change Orders, Change Directives, Supplemental Instructions, for effect on construction schedule and on Contract Time.
.18 Review of status of as-built documents.
.19 Review of site safety.
.20 Review of commissioning schedule and requirements and commissioning status.
.21 Other business.

.3 Pre-Installation Meetings
.1 During the course of the Work prior to Substantial Performance of the Work, schedule pre-installation meetings as required by the Contract Documents and coordinated with the Consultant.
.2 As far as possible, pre-installation meetings shall be scheduled to take place on the same day as regularly scheduled progress meetings.
.3 Agenda to include the following:
.1 Owner's guidelines and policies.
.2 Appointment of official representatives of participants in the Project.
.3 Review of existing conditions and affected work, and testing thereof as required.
.4 Review of installation procedures and requirements.
.5 Review of environmental and site condition requirements.
.6 Schedule of the applicable portions of the Work.
.7 Schedule of submission of samples, colour chips, and items for Consultant's consideration.
.8 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences.
.9 Requirements for notification for reviews. Allow a minimum of 48 hours notice to Consultant for review of the Work.
.10 Requirements for inspections and tests, as applicable. Schedule and undertake inspections and tests.
.11 Delivery schedule of specified equipment.
.12 Special safety requirements and procedures.
.4 The following shall be in attendance:
.1 Contractor.
.2 Subcontractors affected by the work for which the pre-installation meeting is being conducted.
.3 Consultant.
.4 Manufacturer's representatives, as applicable.
.5 Inspection and testing company, as applicable.

.4 Commissioning Meetings: refer also to Section 01 91 01.

.5 Special Meetings:
.1 Owner and/or Consultant reserve the right to require special meetings which may be held on short notice and at which attendance by Contractor and representatives of affected Subcontractors and Suppliers is mandatory. Contractor shall keep detailed and accurate meeting notes and distribute copies
promptly to all in attendance and those affected by agreements made at such meetings.

1.14 Schedule

.1 Schedules Required.
.1 Construction Progress Schedule. The Contractor shall cooperate and fully inform the Owner of their schedules and work to be done.

.2 Schedule Requirements:
.1 Microsoft Project to be used as the scheduling tool.

.2 An updated copy of the schedule both in pdf format and Microsoft Project format is to be provided every two weeks to the University and Consultants.
.3 The schedule must show the following:
.1 Initial planned start date and finish date for each item work.
.2 Actual start and completion dates.
.3 Critical path.
.4 Schedule must be reviewed and confirmed that all activities required for the successful construction have been accounted for.

.3 Format
.1 Unless otherwise advised, prepare schedule in form of horizontal bar chart.
.2 Provide separate bar for each trade or operation.
.3 Provide horizontal time scale identifying first work day of each week.
.4 Format for listings: List of Contents of this specification.

.4 Submission
.1 Submit initial schedules within 7 days after award of Contract.
.2 Submit 2 copies to be retained by Consultant.
.3 Consultant will review schedule and return reviewed copy within 10 days after receipt.
.4 Resubmit finalized schedule within 7 days after return of reviewed copy.
.5 With each application for progress payment, submit an up-to-date schedule.

.5 Maintenance and Resubmission
.1 Monitor progress of work relative to approved schedule.
.2 Submit schedules at each progress (site) meeting indicating actual progress of the Work relative to approved schedule.
.3 Advise Consultant and Owner where progress of work varies from schedule, paying particular attention to variances that may result in delay of completion of Work, in whole or in part, or achievement of any milestone dates.
.4 Where progress of work varies from approved schedule, revise and resubmit schedule, showing means to recover from delays and achieve completion date(s).
.5 Revise and resubmit schedule to reflect extensions in Contract Time agreed to in Change Orders.
.6 All Site Instructions, Change Orders and Requests for Information must be entered on the schedule and then indicated how they affect the overall schedule. All weather conditions initiating resulting in lost days must also be entered on the schedule with their overall affect noted.
.7 Owner’s or Consultant’s acceptance of revised schedules showing completion dates later than contractually agreed shall not relieve Contractor of any responsibility for compensating Owner for costs incurred as a result of delayed completion of work, nor result in any liability by the Owner or the Consultant to the Contractor for additional costs due to the Contractor’s delay in completing the Work.

1.15 Quality Control

.1 Refer to Section 01 45 01 Quality Control.

1.16 Construction Facilities and Temporary Controls

.1 Sanitary facilities, water supply, temporary heating, temporary power, and temporary telephone: refer to Section 01 51 01 Temporary Utilities.

.2 Construction facilities, site storage/loading, equipment/tool/materials storage: refer to Section 01 52 01 Temporary Facilities

.3 Temporary controls: refer to Section 01 5 01 Temporary Controls

.4 Project Cleanliness: refer to Section 01 74 01 Cleaning.

.5 Assistance with Consultant's Site Review

.1 The Contractor shall render all necessary assistance to the Consultant and if required shall take and furnish him with levels, measurements, or anything else required by the Consultant to review the Work. The Contractor shall provide sufficient, safe and proper facilities at all times for the review of the Work by the Consultant.

1.17 Material and Equipment

.1 Refer to Section 01 61 01 Material and Equipment.

1.18 Additional Documents Required

.1 In addition to the requirements of CCDC 2 – 2008, GC 3.9, maintain at place of the Work one copy of each of the following:

.1 additional written instructions that change this work and supplement the Contract;
.2 one copy of each Change Order and Contemplated Change Order;
.3 Field Inspection and test reports by testing and inspection agencies;
.4 one copy of each of the Consultant's site visit reports;
.5 copy of approved work schedule;
.6 manufacturers' installation and application instructions;
.7 reviewed shop drawings and other submittals; and
.8 up-to-date progress schedule.

1.19 Daily Log

.1 Maintain a daily log recording following data:

.1 An address directory recording the names, address and telephone number of representative of all subcontractors, trades and suppliers doing work or supplying material for project.
.2 Record briefly various items of work being carried out on each day including the number of workers and amount of work completed.
.3 Record maximum and minimum daily weather temperatures both inside and outside of the building. In this regard the Contractor shall maintain a minimum/maximum thermometer both inside and outside the building for the duration of project.
.4 Record ordering dates and receiving dates of material F.O.B. job site to the site.
.5 Record accidents and first aid given.

.2 Daily log shall be open to review by the Consultant and by the Owner. Upon request, provide copy of log to Owner or Consultant.

1.20 Existing Assemblies: Fire Separation Integrity

.1 Unless otherwise indicated, assume all existing walls, floors and ceilings are fire separations that have a fire resistance rating of at least 1 hour. Assume all existing doors and frames have fire ratings, whether bearing a fire-rating label or not.

.2 Execute work to maintain fire resistance rating integrity and fire separation integrity, including but not limited to reclipping acoustic ceiling tiles, and fire stopping openings to Building Dept. satisfaction, and as otherwise specified or indicated.

1.21 Existing Conditions Assessment

.1 Where the Contractor is required to remove and re-install existing assemblies, elements or materials to suit work of this Contract, survey same for damage existing prior to the start of work, other than that caused by the Contractor during other work operations.

.2 Submit written statement to Consultant outlining damage where damage exists.

.3 Commencement of work shall mean the Contractor accepts existing conditions as being without damage.

1.22 Repair, Restore, & Make Good

.1 Repair, make good or restore shall mean the use of materials and technologies and methods to return damaged assemblies, elements or materials to the better of

the condition in which they were prior to the beginning of construction, or to the standard specified in other Sections for new work. In general, repaired areas shall be indistinguishable from adjacent areas.

.2 Repair, make good or restore damaged assemblies, elements or materials where assemblies, elements or materials are damaged by work of this Contract, or by operations of the Contractor during the work of the Contract. This shall include elements damaged by removal of abutting elements.

.3 Repair, make good or restore damaged utilities or services where utilities or services are damaged by work of this Contract, or by operations of the Contractor during the work of the Contract.

.4 Use repair materials which match the damaged substrates, or are recommended for repair of the damaged materials, which retain or return the damaged assemblies, elements or materials to their specified architectural, structural and fire-resistant/fire rated capabilities.

.5 Where no recommended repair material exists, provide the Consultant with options from which to select a preferred repair. Consultant's selection and decision shall be final.

.6 At penetration of fire-rated wall, ceiling or floor construction, completely seal voids with fire-rated and/or fire-resistant materials, to ensure the fire rating of the assembly being penetrated is maintained. Applied materials as outlined by manufacture for the construction element involved.

.7 Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to the nearest intersection. For assembly, refinish entire unit.

1.23 Unexpected Discovery of Asbestos

.1 Where a friable material is discovered during construction, renovations and/or demolition and it is suspected to contain asbestos, stop all work that may disturb the material. Advise the Owner of the discovery and await instructions.

1.24 Designated Materials in Existing Paint

.1 Proceed on the basis that all existing paint contains lead, mercury or other designated substances.

.2 Take all necessary health and safety precautions.

1.25 Compressed Gas or Explosive-Actuated Fastener Tools

.1 Use of compressed gas or explosive-actuated fasteners and associated tools is prohibited in buildings occupied by the Owner.

.2 Use of compressed gas or explosive-actuated fasteners and associated tools is accepted in buildings unoccupied by the Owner, and where stray fasteners will not injure personnel.

.3 Use explosive-actuated and compressed gas fastener tools only under strictest safety conditions. Keep equipment locked in storage cabinet unless in active use by personnel. Equipment shall not be left unattended, or be accessible to anyone other than authorized users.

1.26 Climatic Conditions

.1 Where the climate may affect in any manner the ways and means for the performance of the work or the timing for the project, thoroughly examine the climatic data for the past 10 year period, and incorporate all information reasonably inferable from such data into the Contract Price, Construction Schedule and Contract Time.

1.27 Hazardous Materials

.1 Hazardous materials shall not be introduced for experimental or any other use

prior to being evaluated by the Consultant.

.2 Make known any hazardous materials to be used and method of application before using. Be responsible for storage and proper safety requirements.

.3 Where a suspected hazardous material is discovered during construction, renovations and/or demolition stop all work that may disturb the suspected hazardous material. Advise the Owner of the discovery and await instructions.

.4 The disposal of hazardous chemical waste such as PCB's, mercury, oil shall be disposed of through the use of the following contractor's services: RPR Environmental, 164-166 South Service Road, Stoney Creek, Ontario L8E 3H6, telephone number 1-800-667-5217, facsimile number is 1-905-662-3828, contact name is Patrick Whitty and e-mail address is pat@rpr-environmental.com.

1.28 Discovered Valuables

.1 All articles of value, such as relics, antiquities, or items of historical or scientific interest which may be discovered during demolition, dismantling, or excavation of the Place of the Work are the property of the Owner and shall be immediately delivered into the custody of the Owner.

1.29 Smoking Restrictions

.1 Smoking is forbidden within all buildings on the Owner's property and within 9.0 meters of any entrance or exit. Failure to comply will require offenders to leave the property and may result in loss of future business. Repeat offenders shall be removed from the site.

1.30 Security and Keys

.1 Comply with Owner's policy and practices regarding site and building security. Do not reduce level of security afforded to building and site by work of this Contract.

.2 Owner will issue keys for areas upon receipt of cheque, made payable to the University of Guelph as refundable deposit upon return of keys in good condition.

.1 Service keys--NSK, HOSK singular or as a pair ... $500.00 each
.2 Building masters ..... $500.00 each
.3 Building sub masters ..... $300.00 each
.4 Housekeeping keys ..... $300.00 each
.5 Individual room keys ..... $200.00 each

.3 Owner's policy requirements include but are not limited to:

.1 Minimum 48 hours prior to start of work arrange with Owner to obtain keys and adjust security alarms for overtime work.

.2 Do not copy Owner's keys. Return Owner's keys to Owner prior to issuing final invoice for work. Owner reserves the right to withhold all or part of final payment, in addition to deposit made, until keys have been returned. In the event of loss of key, the Contractor shall reimburse the Owner, by means of a deduction from any amounts due the Contractor and by direct reimbursement, for all costs associated with keying plus 100% overhead.

.3 Upon return of keys obtain receipt of keys from Owner. Make arrangements via Owner's representative for refund of key deposit.

.4 Calls to the Owner from the subcontractors for keys or access to the building are prohibited. It shall be the Contractor's responsibility to arrange access for workers.

.4 Ensure all doors and windows are locked and secured prior to leaving the site.

1.31 Subcontractors

.1 The Owner reserves the right to reject a proposed subcontractor in accordance with the provisions of CCDC 2 - 2008.

.2 Subcontractors named in the Contractor's Bid Form shall be engaged for work of this Contract, and shall not be replaced by the Contractor except with the Owner's prior consent.

1.32 Identification

.1 All personnel engaged by the Contractor, directly or indirectly, in work of this Contract shall wear identification badge issued by Owner while on Owner's property.

.2 Badges are the property of the Owner and shall be returned at the earlier of completion of work or upon request.

1.33 Inspections by Authorities Having Jurisdiction

.1 The Contractor shall arrange all inspections required by Authority(s) Having Jurisdiction.

.2 Where the Owner feels it necessary, for any reason whatsoever, the Owner may also arrange for the Authority(s) Having Jurisdiction to attend at the work site.

2. Products Not Used.

3. Execution Not Used.

**********END**********

1. General

1.1 Related Work

.1 Section 01 11 01 General Requirements

.2 Section 01 21 01 Allowances

.3 Section 01 57 01 Temporary Controls

.4 Section 01 77 01 Cleaning

.5 The requirements of this Section apply to all other Sections of the specifications.

1.2 Building Permit and Regulatory Inspections

.1 The Owner will apply and pay for the Building Permit required under the Ontario Building Code. Contractor is advised that workload at the authorities having jurisdiction may delay permit issuance.

.2 Application and payment for all damage deposits, and other permits, licenses, fees and costs remain the responsibility of the Contractor. For clarification, the Contractor is required to post all damage deposits required by the authorities having jurisdiction as a condition of permit issuance.

.3 Obtain copy of Building Permit from Owner, complete with drawings on which authorities having jurisdiction may have made comments, and examine same. Advise Consultant of any changes required, complete with associated costs

.4 Arrange all required inspections by authorities having jurisdiction on behalf of the Owner.

1.3 Preconstruction Survey

.1 Prior to commencing work, complete a survey of existing conditions within work area(s) and along path of travel for goods to be delivered and removed from the site.

.2 Prior to commencing work, complete a survey of existing site services and utilities within work area(s) and along path of travel for goods to be delivered and removed from the site.

.3 Owner will accompany Contractor on inventory tour. Arrange mutually agreeable time for survey.

.4 Inventory all existing damage, accurately recording all observed conditions. Use photographs, written records, spreadsheets videography, etc. to fully document existing conditions, noting existing damage in sufficient detail to act as record of conditions.

.5 Within 2 business days of inventory, and prior to commencing demolition or construction, provide each of Owner and Consultant with copy of inventory records. Identify photographs using room numbers and detailed descriptions of observed damage.

.6 Owner will review submission. Revise and resubmit rejected inventory. Demolition and/or construction may only commence after acceptance by Owner of inventory records.

.7 Repair and make good any damage found subsequent to submission of inventory, which in the opinion of the Consultant is the result of the Work, and which is not documented in the inventory submitted to the Owner and Consultant to

Owner. Repairs shall return damaged elements to their condition prior to start of work. Where work increases extent of existing damage, repair shall return element to match previous damaged condition. Refer to CCDC 2 – 2008, GC 9.1

.8 Where repairs cannot, in the opinion of the Consultant, be expediently implemented the Consultant shall ascertain the value to be deducted from the amounts due the Contractor in the manner permitted under CCDC 2 – 2008, GC 2.4.

1.4 Asbestos

.1 There is asbestos present in the building, but there is no known asbestos present in the area in which the Work is expected to occur. Obtain detailed building asbestos inventory from Owner prior to starting work

.2 Comply with applicable legislation regarding asbestos. Should the Contractor encounter asbestos or material that is suspected to contain asbestos during the course of the Work, report same to Owner. Owner will advise means of confirming or denying asbestos is present and will advise regarding process for removal.

1.5 Other Contracts: Legislative Compliance

.1 Be advised that the Owner may let other contracts for other works in the building, and the work of this Contract shall be organized as directed by the Owner to prevent the Owner becoming the *constructor* for these projects as defined in applicable Occupational Health and Safety legislation.

.2 Comply with directives to achieve objectives in sentence above.

1.6 Special Suspension Requirements for Suspended Ceilings, Mechanical and Electrical Elements

.1 Existing suspended acoustic tile ceilings, and suspended mechanical and electrical items, when re-installed, shall be suspended from and anchored to structural loadbearing members. Where existing hangers and supports are of inadequate length, size or strength, provide new suspension systems. The term loadbearing shall be as defined in the Ontario Building Code.

.2 For greater clarity, and in addition to other site conditions that affect support systems, note that suspended items are occasionally supported from suspended ceilings that will be demolished and not be replaced, requiring extended hangers to secure elements to loadbearing structural members. Unless otherwise indicated or accepted by the Consultant, existing suspended ceilings are not considered acceptable support for suspended elements.

**********END**********

PART ONE - GENERAL

1. Contractor's Use of Premises and Project Scheduling

.1 Execute construction work starting on **March 1 2017,** (subject to receipt of regulatory approvals) achieve Completion of Contract as defined in applicable lien legislation not later than **July 28 2017.**

.2 Work Hours

.1 Contractor shall have unrestricted work hours, subject to applicable legislation, between ***March 1 2017 to July 28 2017 only between the hours of 6:00am to 6:00pm each day*** except as required to suit other activities in the building and on campus. Limit use of premises to allow for Owner's continued use of the site. ***Confine vehicles to paved areas of the site***. Do not block fire access routes.

.3 After Hours Work

.1 ***All work will be during normal work hours.*** Schedule work with staff through the Owner's representative so as to limit disruption to ongoing operations. Include for any overtime, to ensure orderly and continuous progression of work and maintain Owner's operation of facility.

.2 Arrange 48 hours in advance with Owner's representative to obtain keys and adjust security alarms for overtime work.

.3 Be responsible for ensuring doors and windows are secured prior to leaving the building.

.4 Work in the building prior to **March 1 2017** shall consist of and be limited to measuring and other similar non-intrusive work, which shall occur after classes have recessed for the day, unless otherwise agreed by the Owner.

.5 Execute work on weekday and in regular work hours to complete the Work on schedule.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 00 73 01 Supplementary Conditions.

.2 Section 01 18 01 Utility and Building System Service Interruptions: provisions regarding system shutdown and re-activation.

.3 Section 01 18 01 Utility and Building System Service Interruptions for particular provisions regarding fire alarm and fire protection system shutdowns and re-activation.

.4 The requirements of this Section apply to all other Sections of the specifications.

1.2 Fire Protection and Fire Safety

.1 Provide temporary fire protection throughout the period of construction.

.2 Particular attention shall be paid to the elimination of fire hazards.

.3 Take all necessary precautions to prevent fires, and to prevent damage to buildings, materials, personnel, equipment, furnishings and chattels.

.4 Provide fire extinguishers as required by the stricter of the Occupational Health and Safety Act and regulations made thereunder, and the Ontario Fire Code.

.5 Comply with the Owner's directives regarding fire safety.

.6 Hot Work Permits

.1 A Contractor’s Hot Work Permit must be submitted in writing to the Owner’s Construction Coordinator for any and all work involving bitumen kettles, open flame, cutting, grinding, soldering or welding or any hot surface applications in occupied facilities. For clarification, all existing buildings and tunnels are considered occupied facilities. Contractor’s Hot Work Permit to contain, at a minimum, the following information:

.1 Company performing hot work
.2 Location of hot work
.3 Nature of hot work
.4 Duration of hot work – including the time frame for fire watches
.5 Name and contact information of person performing the work and of the person supervising hot work and of the person(s) conducting the fire watches
.6 Protection method against false fire alarms and/or sprinkler activation
.7 Precautions being taken

.2 Submit permits a minimum of 48 hours in advance of commencing hot work.

.3 Do not perform hot work without the Owner’s written approval or sign-off on the Contractor’s proposed Hot Work Permit.

.4 The approved hot work permit must be clearly displayed on site at the location of the hot work.

.5 Follow all applicable legislation and standards including but not limited to Ontario Fire Code O. Reg. 256/14 which amends O. Reg 213/07 and OHSA O. Reg 851 and CSA Standard W117.2-94 when performing hot work.

.7 Electric & Gas Welding & Cutting Operations

.1 Conduct all work involving electric and gas welding and cutting and grinding operations in accordance with the safety standards specified in the latest edition of CSA W117.

.8 Flammable Liquids

.1 Flammable liquids are to be kept to a minimum and shall be stored in approved safety containers. Obtain Owner's prior approval for storing flammable and combustible liquids in occupied buildings.

.9 Fire

.1 In the event of a fire use the nearest pull station and/or call Owner's emergency number 52000 or 9-911. If the fire is extinguished without using City of Guelph Fire Department, immediately notify Owner's Security Services at extension 52000.

.10 Emergency Telephone Numbers: be advised of the following emergency services contact telephone numbers

.1 Guelph Ambulance, Fire and Police Service: 9-911

.2 Guelph General Hospital: 519-822-5350

.3 U. of G. Fire Division: 519-824-4120 (extension 52071 for administration , **extension 52000 for emergency**)

.4 U. of G. Police Division: 519-824-4120 (extension 52245 for administration, **extension 52000 for emergency**)

1.3 False Fire Alarms

.1 Reimburse the Owner, by means of a deduction from any amounts due the Contractor by the Owner, for all costs related to false alarms of the fire alarm system or the security alarm system attributable to acts or omissions of the Contractor. Costs shall include charges levied by local authorities, charges levied by the Owner's alarm monitoring service, labour and expense costs for Owner's staff to attend at site in response to a false alarm, Consultant's cost related to any work for a false alarm, all to a minimum of $500 per false alarm incident.

1.4 Fire Alarm Activation

.1 A fire alarm system that has been activated by other than testing shall not be reset until the cause of the alarm has been investigated and until authorized by the Owner or the Fire Department.

1.5 Fire Protection Equipment Impairment

.1 Take all precautions when fire protection equipment (nearby hydrants, sprinklers, chemical fire suppression systems, standpipes, fire extinguishers, related water service, etc.) is taken out of service, including but not limited to restricting all hot work operations and hazardous processes.

.2 Take measures to minimize the shut down or impairment of use of fire protection. Plan operations required to reduce system impairment time to the least amount possible.

.3 Advise Owner of complete or partial impairment of fire protection system, including time required, areas affected, etc., in accordance with Section 01 18 01 Utility and Building System Service Interruptions.

.4 Provide temporary protection such as extra extinguishers during all periods of fire protection equipment impairment.

.5 If fire protection system is restorable, either in whole or in part, assign personnel during the period of impairment to restore the system promptly in the event of a fire.

.6 During periods when fire protection service is interrupted, establish and maintain a fire watch, including but not limited to the following:

.1 Patrol all corridors and high-risk areas affected.
.2 Fire patrol shall have immediate access to a phone and call extension 52000 or to call 9-911 if they see a fire.
.3 Report all other problems encountered.
.4 Remain on patrol until fire protection system is returned to full operation.

1.1 Fire Routes

.1 Parking in posted fire routes will not be permitted. Vehicles found parked in a posted fire route may be towed without warning at vehicle owners' expense.

1.2 Fire Safety Plans

.1 Where the work will affect existing fire alarm system, existing means of egress and existing fire exits, alternative measures related to maintaining a fire alarm system, means of egress and exiting are to be planned, clearly set down in writing, clearly delineated on floor plans and submitted for approval.

.2 Alternative measures must include signage, fire watches for the affected areas, procedures for notification to all occupants and users, construction personnel, Physical Resources, the University's Fire Prevention Office and City of Guelph Fire Department.

.3 Alternative measures related to fire alarm system shall include modifications and temporary installations related to maintaining an fire alarm system including elements such as detectors, early warning lights and bells and fire alarm pull stations.

.4 Approved alternative measures are to be posted in the building at the main entrance to the building.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Requirements

.2 Section 01 21 01 Allowances

.3 Section 01 14 05 Fire Safety Requirements

.4 Section 01 51 01 Temporary Utilities

.5 The requirements of this Section apply to all other Sections of the specifications.

1.2 Owner's Use Of Premises

.1 Take all measures necessary and as directed by the Owner to minimize disruption of facilities and their use by the Owner. Facilities generally include buildings, roads, parking lots, tunnels, landscaped areas and all spaces normally occupied by the Owner and shall include any existing utilities and services.

.2 Take all measures necessary and as directed by the Owner to minimize disruption of adjacent facilities and areas of the Owner's property, and use by the Owner.

.3 Be advised that Owner's facilities and chattels include numerous scientific, research and other valuable efforts and goods, and the Owner's facilities contain irreplaceable contents. Unplanned loss of utilities may cause irreparable loss.

.4 Work carried out during Owner's standard operating hours shall not adversely affect the Owner's ongoing use and occupancy of the building, the site or adjacent buildings or facilities, otherwise work shall be carried out after regular working hours, on weekends and statutory holidays. Schedule work with the Owner to minimize disruption to Owner's operations. Contract Price includes all necessary overtime premium costs and cost to work statutory holidays, to ensure orderly progression of work and continuous operation of the Owner's facilities.

1.3 System Shutdown Requirements: Owner's Systems

.1 Arrangements for shut down of Owner's utility and building systems (interruption of service) will be mutually arranged between the Owner and the Contractor. No shutdown to occur without the prior written consent of the Owner. Provide minimum 4 full working days advance notice of any required shutdown of an Owner's system, either in whole or in part.

.2 Where length of service shutdown will exceed 12 hours, provide minimum 7 full working days advance notice of shutdown.

.3 Schedule service shutdowns to occur outside Owner's regular operating hours, unless otherwise agreed.

.4 Provide detailed schedule of operations for shutdown.

.5 Obtain Owner's acceptance of proposed shutdown.

.6 Unless otherwise agreed or as required by Contract Time, schedule steam system shutdowns to occur during warm weather where construction extends into periods of normally warm (summer) weather.

.7 Unless otherwise agreed or as required by Contract Time, schedule chilled water system shutdowns to occur during cool or cold weather where construction extends into periods of normally cool or cold weather.

.8 Unless otherwise agreed or as required by Contract Time, where construction extends into Owner's summer semester, schedule all other shutdowns to occur during this period.

.9 Take all measures to minimize period of shutdown/interruption of service.

.10 Systems that may require shutdown include, but are not limited to:
- .1 normal power, including power distribution, lighting, etc.;
- .2 essential (emergency) power;
- .3 heating, cooling or ventilating systems;
- .4 domestic water;
- .5 chilled water;
- .6 sanitary sewer or drains;
- .7 storm sewer or storm drains;
- .8 steam;
- .9 raw water;
- .10 compressed air;
- .11 natural gas;
- .12 de-ionized water;
- .13 scientific vacuum systems;
- .14 fire alarm;
- .15 sprinkler system;
- .16 hose and standpipe system;
- .17 medical and scientific gases;
- .18 telephone, data or other telecommunications systems;
- .19 roads, parking lots and walkways;
- .20 areas of buildings.

.11 Subject to 1.3.12 below, the Contractor is responsible for providing qualified personnel to implement shutdown and re-activation of services. The Owner reserves the right to attend and monitor the shutdown and re-activation to assess effects on remainder of property and physical plant.

.12 The Owner reserves the right to shutdown and re-activate Owner's utilities and/or services under the Contractor's direction, where the utility and/or service affects buildings or parts thereof outside the Contractor's work area and in the Owner's opinion there is a significant concern of adverse impacts outside the work area arising from the shutdown and re-activation. Where Owner elects to implement shutdown and re-activation, Contractor shall have qualified personnel attend and direct the shutdown and re-activation process.

1.4 Fire Alarm Shut Down Procedure

.1 Arrangements for shutdown (interruption of service) of fire alarm system will be mutually arranged between the Owner and the Contractor. No shutdown to occur without the prior consent of the Owner. Provide minimum 5 full working days advance notice of any required shutdown of Owner's system, either in whole or in part. Where length of service shutdown will exceed 12 hours, provide minimum 7 full working days advance notice of shutdown.

.2 Schedule service shutdowns to occur outside Owner's regular operating hours, unless otherwise agreed.

.3 Provide detailed schedule of operations for shutdown.

.4 Obtain Owner's acceptance of proposed shutdown.

.5 A Certified Fire Alarm Technician, per the Ontario Fire Code section 1, subsection 1, shall supervise additions and changes to the fire alarm system, including but not limited to changes in device location, and removal and re-installation of devices.

.6 Provide proof of staff certification upon request.

.7 Minimize periods of interruption of existing fire alarm system (shut down).

.8 Wherever possible, shut down only the devices or the zone needing work and schedule this down time in unoccupied hours to the greatest extent possible.

.9 Place signs at all de-activated pull stations indicating pull station is out of service. Remove signs immediately once pull stations are re-activated.

.10 During periods of audibility and visibility testing, place signs at all building entries indicating such testing is occurring, and indicating hours of testing. Remove signs upon completion of testing.

.11 During dust creating operations, and when there are workers present to maintain a fire watch, smoke and heat detectors may be protected by protective devices such as protective cones, or plastic bags secured over the detector. Detectors shall be unbagged at end of each workday, and when workers are not present, or provide fire watch as specified for fire alarm shut down.

.12 Review the proposed period when the system will be disabled, in whole or in part, with Owner prior to any partial or complete system shut down, and obtain Owner's prior approval for shut down.

.13 The Owner will advise affected Owner's personnel normally resident in affected building of fire alarm system shut down. This will include instructions to call extension 52000 or to call 9-911 if a fire is observed.

.14 Establish and maintain a fire patrol for all periods when the fire alarm is shut down, in whole or in part, and such fire watch shall include but is not limited to the following:

.1 Patrol all halls and high-risk areas affected.

.2 Fire patrol shall have immediate access to a telephone and call extension 52000 or call 9-911 if they see a fire.

.3 Report all other problems encountered.

.4 Remain on patrol until system is restored to service.

.5 Where alarms (bells, etc.) are temporarily disabled, provide staff to monitor panel. Staff shall be knowledgeable with panel operation and be able and prepared to either immediately return panel to service, or be capable of raising fire alarm in the building through other means such as manual activation of bells, and through use of phones to alert Fire Dept. Such panel monitoring staff shall be equipped with two-way radios connected to other staff in the building who can advise the panel monitor to sound the alarm.

.15 Provide full details to Owner's fire alarm monitoring service as requested including contact name, company name, and length of time service is interrupted.

.16 An approved inspection firm shall verify all new and replaced fire alarm devices, in accordance with applicable regulations. Submit Certificate of Verification prior to applying for Substantial Performance, or Completion of Contract as defined in applicable lien legislation where no application is made for Substantial Performance.

1.5 System Shutdown Requirements: Municipal Utility System

.1 Provide Owner with minimum 5 full working days advance notice of any required shutdown of municipal utility, either in whole or in part.

.2 Where length of service shutdown will exceed 12 hours, provide not less than 7

full working days advance notice of shutdown.

.3 In general, schedule service shutdowns to occur outside Owner's regular operating hours.

.4 Provide detailed written schedule of operations for shutdown.

.5 Obtain Owner's written acceptance of proposed shutdown.

.6 Take all measures to minimize period of shutdown/interruption of service.

1.6 Safety

.1 Provide all necessary safety measures resulting from or required by shutdown of utility or service.

.2 Advise Owner of any safety precautions required of Owner during system shutdown. Such measures may include, with Owner's prior consent, rescheduling uses, cancellation of uses, etc.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Conditions.

.2 Section 00 73 03 Supplementary Conditions.

.3 Details of work covered by cash allowance: in respective Section.

1.2 Cash Allowances

.1 Refer to CCDC 2 - 2008, GC 4.1.

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

.3 Expenditures under cash allowances shall be authorized by the Owner through the Consultant.

.4 Where costs under cash allowances exceed the total amount of the cash allowances indicated by less than 10% of the aggregated stated values, the Contractor will be compensated for any excess incurred and substantiated, without any allowance for overhead and profit.

.5 Where costs under cash allowances exceed the total amount of the cash allowances indicated by more than 10% of the aggregate stated values, the Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in the Contract Documents.

.6 Progress payments on accounts of work authorized under cash allowances shall be included in the Consultant's monthly certificate for payment. Submit invoices in support of claims.

.7 Where costs under a specific cash allowance exceed of the amount of the allowance, unexpended amounts from other specific cash allowances shall be reallocated at the Consultant’s direction to cover the shortfall.

.8 The amount of each allowance, for Work specified in the respective specification Sections, exclusive of any Value Added Tax shall be:

.1 *$30,000 for Asbestos Abatement*
.2 *$5,000 for Door Hardware*
.3 *$5,000 Signage*

.9 Unexpended total balance of allowances shall be deducted from the Contract Price by Change Order.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 00 21 01 - Instruction to Bidders: Product or System Options.
.2 Section 01 29 01 - Payments

1.2 General

1.0 Prices included in the Agreement shall be complete for the applicable work, and shall constitute the full consideration, payment, compensation and remuneration to the Contractor for all such. For greater certainty, but without limitation to the foregoing, such prices will constitute full and complete consideration, payment, compensation and remuneration to the Contractor for the following (subject to adjustment only as specified in the Contract Documents):

1.1 Expenditures for wages and for salaries of workmen, engineers, superintendents, draftsmen, foremen, timekeepers, accountants, expeditors, clerks, watchmen and other such personnel as may be approved, employed directly under the Contractor and while engaged on the applicable work at the site and expenditures for travelling and board allowances of such employees when required by location of the applicable work or when covered by trade agreements and when approved; provided, however, that nothing shall be included for wages or salary of the Contractor's firm if the Contractor is a firm or the salary of any officer of the Corporation if the Contractor is a corporation, unless otherwise agreed to in writing;

1.2 Expenditures for material used in or required in connection with the construction of the applicable work including material tests and mix designs required by the laws or ordinances of any authority having jurisdiction and not included under Subparagraph .9 (or paid from a cash allowance in Section 01020);

1.3 Expenditures for preparation, inspection, delivery, installation and removal of materials, plant, tools, and supplies;

1.4 Temporary facilities as required for the applicable work;

1.5 Travelling expenses properly incurred by the Contractor in connection with the inspection and supervision of the applicable work in connection with the inspection of materials prepared or in course of preparation for the applicable work and in expediting their delivery;

1.6 Rentals of all equipment whether rented from the Contractor or others, in accordance with approved rental agreements including any approved applicable insurance premiums thereon and expenditures for transportation to and from the site of such equipment, costs of loading and unloading, cost of installation, dismantling and removal thereof and repairs of replacements during its use on the applicable work, exclusive of any repairs which may be necessary because of defects in the equipment when brought to the work or appearing within thirty (30) days thereafter;

1.7 The cost of all expendable materials, supplies, light, power, heat, water and tools (other than tools customarily provided by tradesmen) less the salvage value thereof at the completion of the applicable work;

1.8 Assessments under the Workers' Compensation Act, the Unemployment Insurance Act, Canada Pension Act, statutes providing for government hospitalization, vacations with pay or any similar statutes; or payments on account of usual vacations made by the Contractor to his employees engaged on the applicable work at the site, to the extent to which such assessments or payments for vacations with pay relate to the work covered by the specified price; and all sales taxes or other taxes where applicable;

1.9 The amounts of all Subcontracts related to the specified price;

1.10 Premiums on all insurance policies called for under this Contract;

1.11 Royalties for the use of any patented invention on the applicable work;

1.12 Fees for licences and permits in connection with the applicable work;

1.13 Duties/taxes imposed on applicable work.

1.14 Such other expenditures in connection with the applicable work as may be approved;

1.15 Provided always that except with the consent of the Owner, the above items of cost shall be at rates comparable with those prevailing in the locality of the work.

2.0 The above noted list together with the list provided in paragraph 6.3.7 of the Agreement (CCDC 2-2008) shall be used to determine the itemized accounting for any quotation or a Change Directive.

1.3 Unit Prices

.1 Unit prices included in the Agreement, and which were submitted as a part of the bid, shall be based on units of measurement described in the bidding documents to include for labour, materials, preparation of shop drawings, design fees, delivery, handling, disposal of surplus material, applicable taxes, excluding Value Added Tax, and any other direct or indirect expenditures, of such work measured complete in place, and as further described in other Sections of the Specifications.

.2 Unit prices for specified units of measurements, shall apply to any and all work which can be measured in the said units regardless of the variations in productivity and job conditions, or the time when instructions to carry out that work will be issued.

.3 Unit prices shall apply only to the net change in quantities for each unit of work in each change to the work, provided that the instructions to change have been given before the start of applicable work and/or ordering of equipment. The Contract Price shall be adjusted by multiplying the unit price figure in the Contractor's Bid Form by the quantity used for measurement for payment. Consultant's determination of quantity used for measurement for payment shall be final.

.4 After the applicable work has started, the unit prices shall cover the new work without any credit for the work already completed. Work completed and to be removed to accommodate new work shall be paid for as described for Changes in the Work in the General Conditions on a lump sum or by cost and fixed or percentage fee basis. Changes to the quantities of the work executed under Unit Prices, which result in Change to the Contract value, shall not be subject to the allowable overhead and profit mark-ups specified elsewhere for changes.

.5 Unit Prices for "CREDIT" shall be not less than 80% of Unit Prices for "EXTRA".

.6 Value Added Taxes will be calculated on the net change.

1.4 Itemized price

.1 Itemized prices, requested in the Tender Documents, shall be the total amounts included in the Stipulated Price for the specified work, and which are required for accounting purposes. The University reserves the right to remove itemised portions of the work from the project using the prices provided.

.2 The Itemized prices required are:

.1 Itemized Price No. 1
The total amount included in the tender amount for the supply of the vertical folding partition walls as described in the project drawings A-3, A-4, A-8 as well as the specification section 10 22 26.53.

.2 Itemized Price No. 2
The total amount included in the tender amount for the complete removal of

the existing vault as indicated on drawing A-2 and A-7.

.3 Itemized Price No. 3
The total amount included in the tender amount for the complete cleaning patching, repair, and painting of the existing mechanical floor boxes as indicated on drawings A-5, and A-7.

1.5 Separate Price

.1 Separate prices, requested in the Tender Documents, shall not be included in the Stipulated Price. Consistent with their acceptance or rejection by the Owner. They will be carried in the Agreement as an amount separated from the Contract Amount or in a separate agreement.

.2 The required separate prices are as follows:

.1 Separate Price No. 1
The total amount for the supply and installation of the horizontal folding partition walls as described in the project drawings A-3, A-4, A-8 as well as the specification section 10 22 26. Should this price be selected by the owner then Itemized price No.1 would be removed from the contract.

.2 Separate Price No. 2
The total amount for the supply and installation of required alterations in room 001C of Peter Clark hall indicated on drawing A-3, A-4, E-2, E-4, M-2, and M-5.

.3 Separate Price No. 3
The total amount for the supply and installation of new mechanical floor boxes as indicated on drawings A-5, and A-7. Should this price be selected by the owner then Itemized price No.3 would be removed from the contract.

.1 Refer to other Specification Sections for requirements related to each material.

**********END**********

PART ONE – GENERAL

1.1 Related Sections
.1 Section 00 21 03 - Instruction to Bidders: Product or System Options.
.2 Section 01 24 03 - Prices

1.2 General
.1 Alternate prices requested in the bidding documents, and expressed as a "Credit"
or as an "Extra" or a No Cost to the Stipulated Price, shall be used in calculation of the final Contract Amount consistent with their acceptance or rejection by the Owner . The prices shall be calculated in accordance with Section 01 24 03 - Prices. Each alternate price must include all applicable taxes except for the Valued Added Taxes.

1.3 Alternatives
.1 The prices for alternatives required are:

.1 **Alternative Price No. 1**:
.1 *The cost associated with the substitution of XXXXXXXXXXXXXXX as specified in Section XXXXXXXXX X and shown on Drawings XXXXXX in lieu of XXXXXXXXXXXXXXX as specified in Section XXXXX and shown on Drawings XXXX.*

.1 **Alternative Price No. 2**:
.1 *The cost associated with the substitution of XXXXXXXXXXXXXXX as specified in Section XXXXXXXXX X and shown on Drawings XXXXXX in lieu of XXXXXXXXXXXXXXX as specified in Section XXXXX and shown on Drawings XXXX.*

1.4 Project Record Documents
.1 Contractor's as-built drawings shall show the quantity/extent of work executed under Alternatives.

PART 2 - PRODUCTS
.1 Refer to other Sections for requirements related to each material.

PART 3 - EXECUTION
.1 Refer to other Sections for requirements related to each material.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 00 73 03 Supplementary Conditions

.2 Section 01 11 01 General Requirements

.3 Section 01 24 03 Prices

.4 Section 01 29 03 Sample Invoice Format

1.2 General

.1 All submissions under this section shall bear the project name, Owner's name and Project Name, Project No., Consultant Project No., and date.

.2 Where a Certificate of Clearance from the Workplace Safety and Insurance Board (WSIB) is requested, the Certificate submitted shall clearly show that the Contractor is in good standing with the WSIB.

.3 WSIB “independent operator” status for any Contractor is not acceptable.

.4 Contractor is solely responsible for ensuring that each of the Contractor’s personnel, including but not limited to employees, directors, officers, principals and executives of the Contractor, are covered by WSIB insurance.

.5 Contractor warrants and certifies to the Owner that each of the Contractor’s personnel, including but not limited to employees, directors, officers, principals and executives of the Contractor, are covered by WSIB insurance.

.6 Contractor shall defend, indemnify and hold harmless the Owner against any and all claims made due to failure to pay WSIB premiums or provide WSIB coverage for any person engaged by the Contractor, directly or indirectly, for Work of this Contract.

.7 Obtain a valid WSIB Certificate of Clearance from each Subcontractor or Supplier prior to releasing payment to the subcontractor or Supplier. Indemnify and hold harmless the Owner against any failure of the Contractor to obtain valid Subcontractor’s or Supplier’s WSIB Certificate of Clearance prior to releasing payment to respective Subcontractor or Supplier.

.8 All applications for payment after the first shall be accompanied by CCDC Statutory Declaration 9A, duly executed. CCDC Statutory Declaration 9A is acceptable only where it bears an original CCDC Statutory Declaration 9A copyright seal.

1.3 Invoicing Periods

.1 For all other Contracts, submit monthly progress invoices. Invoices shall be dated last day of each month. Submit final invoice within 45 days of Completion of Contract as defined in applicable lien legislation.

1.4 Schedule of Values

.1 Refer to CCDC 2 - 2008, GC 5.2.

.2 Costs of temporary facilities and utilities shall be amortized over the duration of the Work. Claims for ‘mobilization’, ‘bidding costs’ or similar lump sums at or before start of work not acceptable.

.3 Include as separate line items in the Schedule of Values, the following:

.1 Submittals

.2 Final Cleaning – by a professional cleaning service
.3 Commissioning
.4 Project Close-out documentation
.5 Value Added Tax

1.5 Applications for Payment and for Certificates

.1 In addition to other requirements of the Contract, the following information applies to applications for payments, and applications under the Construction Lien Act.

.2 Progress applications

.1 Progress applications for payment shall indicate the value complete of each item in the Schedule of Values, percentage complete to date of application, value previously certified for payment by the Consultant, and value of work remaining. Refer to Section 01 29 03 for sample progress invoice format. All values shall be exclusive of Value Added Tax (GST or HST), except that Value Added Tax shall be applied to the total amount claimed, and the value of Value Added Tax indicated on the application.

.2 Include a summary of changes with application for payment, showing values complete.

.3 No payment will be made for Products ordered or manufactured, but not yet delivered to the Place of the Work.

.4 Include evidence to support claims for Products delivered to the Place of the Work, but not yet incorporated into the Work, as the Consultant may require to establish the value and delivery of the products.

.5 Products delivered to the Place of the Work are the property of the Owner and shall not be removed without the Owner's consent, except where rejected as defective products or removed as legitimate debris. Any Products delivered to the Place of the Work but not yet incorporated into the work shall remain at the risk of the contractor not withstanding that title has passed to the Owner.

.6 In addition to other requirements, progress applications shall indicate the cost of the following items as separate items:

.1 bonds
.2 insurances
.3 temporary facilities and controls
.4 contract closeout, record and as-built drawings, maintenance and operating manuals.
.5 Value Added Tax

.3 Applications for a Certificate of Substantial Performance

.1 Applications for a Certificate of Substantial Performance, release of holdback, and Statement of Completion shall be completed in accordance with OAA/OGCA Document 100 Takeover Procedures (latest edition) In Document 100, substitute "Consultant" for "Architect", and "review" for inspection where it appears in relation to the Consultant's assessment of the Work.

.2 The Contractor shall make written application to the Consultant or the Payment Certifier for the certificate.

.3 The application shall also include:

- statements that the contract is substantially performed;
- a statement that all required submissions have been made;
- statements of completion with a cost value for deficiencies, outstanding documentation, work that can not be performed and which is beyond the Contractor's control, and any work which is to be completed at a later date as agreed to by the Owner; and
- a separate invoice showing the amount of holdback to be released.

.4 If the Consultant finds the application to be complete, the Consultant will visit the Place of the Work to verify the validity of the application.

.5 If the application is approved by the Consultant, the Consultant will issue a certificate of substantial Performance to the Owner and to the Contractor.

.4 Progress applications claiming monies against cash allowances shall be accompanied by true copies of all invoices and statements from suppliers or subcontractors furnishing products, etc., purchased under a cash allowance.

.5 A WSIB Certificate of Clearance, valid for the date on which payment of the progress claim is likely to be made, shall accompany all applications for payment.

.6 All applications shall be accompanied by CCDC Statutory Declaration 9A, duly executed, with a copyright seal. CCDC Statutory Declaration 9A is acceptable only where it bears an original CCDC Statutory Declaration 9A copyright seal.

.7 Provide originals of all documents for invoicing, except that WSIB material may be facsimile copy.

1.6 Release of Holdback

.1 Holdback monies will be released in accordance with applicable legislation. Once the lien period has expired and the holdback monies are no longer held in trust, the Owner may withhold sufficient funds to protect himself from loss on account of any of the following:

.1 Defective work not remedied.
.2 Delay in performance of the work.
.3 Delay in submission of documentation.
.4 Claims filed or reasonable evidence indicating probable filing of claims.
.5 Overpayment for completed work.
.6 Damaged work caused by Contractor, Subcontractors or Suppliers.

.2 When all conditions for which money has been withheld have been remedied, the Consultant will immediately issue (a) certificate(s) for the amount(s) withheld.

.3 A Certificate for Payment of substantial performance holdback will only be made upon receipt by the Consultant of proof of publication of the Certificate of Substantial Performance from the publishing newspaper (Daily Commercial News).

.4 Where the Contractor does not publish the Certificate of Substantial Performance within 10 calendar days of the Consultant's issuance of the Certificate, the Owner may, at the Owner's sole discretion, publish the Certificate of Substantial Performance, deducting the cost of the publication from the Contract Price. Cost of publication will include the advertising fees, plus Owner's and Consultant's labour costs charged at regular hourly rates for time involved in arranging publication. Where there are no regular hourly rates, costs shall be charged at hourly salary or wages multiplied by 3.

1.7 Final Payment

.1 When all deficiencies have been corrected and the work completed, the Contractor will request that the Consultant visit the Place of the Work for a further review.

.2 Upon being satisfied that all deficiencies have been corrected and that all other conditions listed under 1.6.1 above have been satisfied, all to the satisfaction of the Owner, the Consultant will so inform both the Contractor and the Owner.

.3 Upon receipt of the Contractor’s invoice, the Consultant will issue a certificate for final payment.

.4 If a subsequent site review(s) is (are) required to verify 100% completion of

deficiencies, the Contractor will be expected to compensate the Owner, by way of a change order to the Contract, for the time and travel expenses incurred by the Consultant for any subsequent review(s). The rates for time and travel are outlined in an agreement between the Consultant and the Owner.

.5 If the deficiencies are not completed within a reasonable period of time, as agreed to by all parties, the Owner make invoke the requirements of CCDC 2-2008, GC 7.1 – Owners Right to Perform Work or Stop the Work or Terminate the Contract.

1.8 Field/Site Instructions and Supplemental Instructions

.1 Field Instructions, Site Instructions and/or Supplemental Instructions (hereinafter called Supplemental Instructions) are issued only for the purpose of recording any clarifications or interpretation of the Contract Documents or giving direction on field conditions. These instructions are subject to the provisions of the Contract Documents and unless stated herein and specifically co-authorized by the Owner, will not affect the Contract Price or Contract Time.

.2 If in the opinion of the Contractor a Supplemental Instruction involves an increase in the Contract Price or Contract Time, the Contractor shall within 7 working days of receipt of the Supplemental Instruction advise the Consultant in writing accordingly, complete with an itemized proposal. Failure to provide written notification within time stipulated shall be deemed acceptance of Supplemental Instruction by the Contractor without any increase to the Contract Price or Contract Time.

.3 Where the Contractor requests a change in Contract Time or Contract Price due to the provisions of Supplemental Instruction, the Contractor shall not proceed with any work of the Supplemental Instructions until directed. If the Owner accepts the proposal, the Supplemental Instructions will be issued as a Change Order.

.4 Where, in the reasonable opinion of the Consultant or the Owner, the Supplemental Instruction involves a decrease in the Contract Price or Contract Time, the Consultant or the Owner through the Consultant shall advise the Contractor of such opinion, including the details of the proposed adjustment, in writing prior to the final payment being made. The Contractor shall provide satisfactory evidence that an adjustment is not warranted, failing which the Owner shall proceed to deduct the applicable amount from final payment or adjust the Contract Time, as the Case may be. Where, in the opinion of the Consultant or the Owner the Supplemental Instruction warrants a decrease in Contract Time or Contract Price, the Consultant or the Owner through the Consultant shall so advise the Contractor prior to release of final payment.

1.9 Valuation of Changes in the Work

.1 Further to CCDC 2 – 2008, Part 6, the method to be used in determining the value of a change to the Work, by either Change Order or Change Directive, shall be:

.1 estimate and acceptance in a lump sum, unless the Consultant otherwise determines that the method shall be one of:
.2 unit prices set out in the Contract.
.3 cost and a fee.

.2 Where methods .1 or .2 (from 1.9.1 above) are used the Contractor shall provide the Consultant with a detailed cost analysis of the contemplated change indicating:

.1 quantity of each material.
.2 unit cost of each material.
.3 time involved.

.4 subtrade quotations including a complete analysis of costs.
.5 cost of changes to bonding requirements.
.6 markups, if applicable.
.7 value of Value Added Tax as applicable.
.8 proposed change in Contract Time.

.3 Where method .3 (from 1.9.1 above) is used, propose a fee, and a method for determining cost, and any proposed change in Contract Time.

.4 The following shall not be included in the cost of the work but are covered by the allowance (mark-ups) for overhead and profit:

.1 The Contractor's head office and site office expenses, including stationary, postage and other office supplies.
.2 The costs of the Contractor's Project Manager, clerical and administrative personnel, and executive personnel.
.3 Use of temporary offices, sheds, small tools, etc., including the cost of telephone, light, power, water and heat used therein,
.4 Transportation and overnight room expenses for out of town labour, if local labour is available.
.5 Insurance premiums.
.6 Licenses and permits, except when these are special for a particular item of work.
.7 Printing charges for Proposed Changes, Change Orders and Drawings for Contractor's and Subcontractors' use in the work. Consultant will provide one copy of change notice documentation and in the event of re-issue of full size drawings will provide one sepia and one print.
.8 The cost of record drawings and shop drawings.
.9 The cost of clean up and disposal of waste material.

.5 The Contractor shall not be entitled to any additional compensation arising out of changes to the Work other than the amounts determined and agreed to under CCDC 2 - 2008 GC 6.2.

.6 The maximum percentage fee for markups shall be as stated below.

.7 In computing accounts for extras and credits for any Proposed Change, all credits shall be deducted from the total sum of the extras before markups or charges for overhead and profit are added.

1.10 Permitted Mark-ups

.1 The following maximum net overhead and profit mark-ups by Contractors will be permitted for extra work under Change Order or Change Directive:

Cost of Extra Work, not including Value Added Tax	Contractor's Mark-Up on Work of Own Forces (%)	Contractor's Mark-Up on Subcontracted Work (%)
$0 to $5,000	10	7
>$5,000 to $10,000	10	7
>$10,000 to $50,000	7	5
>$50,000	5	4

.2 The following maximum net overhead and profit mark-ups by Subcontractors will be permitted for extra work:

Cost of Extra Work, not including Value Added Tax	Subcontractor's Mark-Up on Work of Own Forces (%)	Subcontractor's Mark-Up on Sub-subcontracted Work (%)
$0 to $5,000	10	7

>$5,000 to $10,000	10	7
>$10,000 to $50,000	7	5
>$50,000	5	4

.3 The permitted overhead and profit mark-ups are not cumulative or escalating. They are a one-time mark-up based on the total cost

.4 The maximum permitted overhead and profit mark-up on materials shall be 10%.

.5 Where a proposed change order includes both credits and extras, overhead and profit mark-ups apply to the net extra or credits, if any, of the entire change.

1.11 Tax Recovery

.1 When an exemption or recovery of government sales taxes, duties or excise taxes is applicable to the Contract, the Contractor shall at the request of the Owner assist, join in, or make application for an exemption, recovery or refund of all such taxes and duties. All amounts recovered or exemptions obtained shall be for the sole benefit of the Owner. The Contractor agrees to endorse over to the Owner any cheques received from the federal or provincial governments as may be required to implement the foregoing failing which the Owner is authorized to deduct the amount from any Contract payment that is then or may thereafter become due to the Contractor.

.2 Maintain accurate records, tabulating equipment and component costs showing all respective taxes and duties or excise taxes. At the request of the Owner, assist, join in, or at Owner's expense, make application on behalf of the Owner for any exemption, recovery or refund, and provide the Owner with copies, or where required originals of records, invoices, purchase orders or other documentation as may be necessary to support such application.

1.12 Application for Certification of Completion of a Subcontract and Early Release of Holdback

.1 Certification of completion of a subcontract will **not** be made.

**********END**********

1.0 Sample Invoice Format

.1 Refer to Section 01 29 01 for invoicing requirements.

.2 The following illustrates a ***sample format*** to follow when submitting progress invoices. Values shown are for illustration purposes only. Provide actual project name and numbers, and name of Owner's representative on completed invoices. Variations from this format are acceptable where all of the information indicated below is provided.

.3 Invoice shall bear be printed on the Contractor's corporate letterhead or otherwise bear the Contractor's name, address, telephone number, and HST registration number.

Attention: Project Co-ordinator (Name)
Design, Engineering and Construction
Physical Resources, Hersey Building
University of Guelph
Guelph, Ontario
N1G 2W1 Facsimile (519) 837-0581

Project: Washroom And Student Space Renovations, University Centre
University of Guelph, Guelph
Consultant File No.: 1601
Physical Resources Project No.: 504000
Date:

Application for Payment No. XX

This is to certify that the value of Work performed and Products delivered to the Place of the Work as of February-28-13 by the Contractor is $ 45,000.00 (exclusive of Value Added Taxes

	Contract Summary			
1	Original Contract Price (excluding HST)		$100,000.00	
2	Change Orders (numbers 1 to 2)		$2,000.00	
3	Current value of Change Directives		$0.00	
4	Value of *Contract Price* on last day of payment period (1+2+3)		$102,000.00	
5	*Value Added Taxes* at 13%		$13,260.00	
6	Total amount payable for the construction of the *Work* including ***Value Added Taxes*** (4+5)			$115,260.00
	Certification Summary			
7	Total Certified 44.1%		$45,000.00	
	Value of Change Orders included above (7)	$2,000.00		
	Value of Change Directives included above (7)	$0.00		
8	Total Holdback @ 10%		$4,500.00	
9	Holdback Released		$0.00	
10	Current Holdback (8-9)		$4,500.00	
11	Amount (value of *Work* performed and *Products* delivered to the *Place of the Work* less holdback retained) (7-10)		$40,500.00	
12	Less amount from previous certificate for payment (include any holdback release)		$15,000.00	
13	amount of *Contract Price* payable current period (11-12)		$25,500.00	
14	Value Added Taxes at 13%		$3,315.00	
15	Amount payable this Certificate including ***Value Added Taxes***			**$28,815.00**

Invoice to be signed by Contractor

Name, credentials and position of person signing
attachments ***(WSIB, Stat Dec 9A, summary of change orders, contract price breakdown, substantiation for cash allowance expenditures, etc.)***
Contractor's HST Registration No.:

1. GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Requirements.

.2 Refer to particular specification sections and drawings for detailed requirements of submissions relayed to particular products and process.

.3 The requirements of this Section apply to all other Sections of the specifications.

1.2 Administrative

.1 Submit list (schedule) of all submittals required, including mock-ups. List each submittal required, projected submission dates, date returned by architect/engineer, remarks, etc.

.2 Submit to Consultant submittals listed for review. Submit with reasonable promptness and in an orderly sequence so as to not cause delay in the Work.

.3 Work affected by submittal, including ordering of Products shall not proceed until review is complete.

.4 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 the Work and Contract Documents.

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

.6 Engineered submittals:

.1 Submittals for items required to be sealed by professional engineer (engineered) shall be duly prepared, sealed, and signed under the direct control and supervision of a qualified professional engineer registered in the province of the Place of the Work, having in force, professional liability insurance with minimum limit of liability of $1,000,000 per claim.

.2 Include with engineered submittal, proof of insurance identifying insurer, policy number, policy term, and limit of liability, on duly signed letterhead and / or certificate of insurance.

.3 Design includes life safety, sizing of supports, anchors, framing, connections, spans, and as additionally required to meet or exceed requirements of applicable codes, standards, regulations, authorities having jurisdiction, and design requirements of the Contract Documents.

.4 Engineered submittals shall include design calculations, complete with references to codes and standards used in such calculations, supporting the proposed design represented by the submittal. Prepare calculations in a clear and comprehensive manner so that they can be properly reviewed.

.5 Professional engineer responsible for the preparation of engineered submittals shall undertake periodic field review, including review of associated mock-ups where applicable, at locations wherever the work as described by the engineered submittal is in progress, during fabrication and installation of such work, and shall submit a field review report after each visit. Field review reports shall be submitted to the Consultant, to authorities having jurisdiction as required, and in accordance with the building code.

.6 Field reviews shall be at intervals as necessary and appropriate to the progress of the work described by the submittal to allow the engineer to be familiar with the progress and quality of such work and to determine if the work is proceeding in general conformity with the Contract Documents, including

reviewed shop drawings and design calculations.
.7 Upon completion of the parts of the Work covered by the engineered submittal, the professional engineer responsible for the preparation of the engineered submittal and for undertaking the periodic field reviews described above, shall prepare and submit to the Consultant and authorities having jurisdiction, as required, a letter of general conformity for those parts of the Work, certifying that they have been Provided in accordance with the requirements both of the Contract Documents and of the authorities having jurisdiction over the Place of the Work.
.8 Costs for such field reviews and field review reports and letters of general conformity are included in the Contract Price.

1.3 Request for Information or Clarification

.1 Submit all requests for information or clarification relating to products or materials to Consultant in due time to avoid delays in product/material delivery allowing sufficient time for reviews by consultants and for corrections and resubmissions if needed.

1.4 Shop Drawings and Product Data

.1 Refer to also to CCDC 2 – 2008, GC 3.10.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connection, explanatory notes and other information necessary for completion of Work.

.3 Adjustments made on shop drawings by Consultant are not intended to change Contract Price or Contract Time.

.4 Make changes in shop drawings as Consultant may require.

.5 Submit an electronic pdf copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

.6 Submit an electronic pdf copy of product data sheets or brochures for requirements requested in specification Sections and as Consultant may reasonably request otherwise where shop drawings will not be prepared due to standardized manufacture of product.

.7 Shop drawings shall be fully dimensioned. Use of standard drawings or brochures is acceptable only if accompanied by drawing showing product in assembled form and showing its relation to adjacent work, methods of anchorage, and other relevant information. Catalogue pages alone are not acceptable. All shop drawings must be to scale.

.8 Shop drawings including catalogue sheets, must identify features to be reviewed. Information, options and sizes not applicable to this project must be stricken out.

.9 Each shop drawing submittal must include the University's project number at the top of each page and the total number of pages in the submission must also be indicated.

1.5 Utility Locates

.1 Submit, as a record, documented locations of all utilities and services at the Place of the Work.

1.6 Samples

.1 Submit for review, samples in duplicate as requested in respective specification Sections.

.2 Deliver samples prepaid to Consultant's business address.

.3 Submit colour chips and finish samples in duplicate.

.4 Keep all approved samples at the Place of the Work. Maintain in good order and available to the Consultant and his representatives for the duration of the Work.

1.7 Mock-Ups

.1 Refer to Section 01 45 01 Quality Control.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Requirements

.2 Allowances: Section 01 21 01 Allowances

.3 Section 01 61 01 Material and Equipment: Material and workmanship quality, reference standards.

.4 The requirements of this Section apply to all other Sections of the specifications.

1.2 Cash Allowance

.1 Include the cash allowance indicated in Section 01 21 01 Allowances to pay costs of miscellaneous testing and inspection as directed by the Consultant.

1.3 Inspection and Testing

.1 Contractor is solely liable for ensuring work conforms to the Documents. Examine all work for conformance with the Documents and have all defective and deficient work corrected before calling for inspections or reviews.

.2 Be responsible for inspection and testing as required by the Contract Documents, statutes, regulations, by-laws, standards or codes or any other jurisdictional authority. Give the Consultant or inspection agencies as applicable timely notice of the readiness for inspection, date and time for such inspection for attendance by the Consultant.

1.4 Site Review

.1 In accordance with CCDC 2 - 2008, GC 2.3.

.2 The Owner and the Consultant shall have access to the Work. If part of the Work is in preparation at locations other than the Place of the Work, access shall be given to such work whenever it is in progress.

.3 Do not conceal work that is designated for review, inspection or testing without permitting Consultant adequate time for reviews. Adequate time shall be defined, for the purposes of this Section, as 3 full business days advance notice of readiness for review, inspection or testing.

.4 The Consultant may order any part of the Work to be examined if the Work is suspected to be not in accordance with the Contract Documents. If, upon examination such work is found not in accordance with the Contract Documents, correct such work and pay the cost of examination and correction. If such Work is found in accordance with the Contract Documents, the Owner shall pay the cost of examination and replacement.

1.5 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies may be appointed by the Consultant, and either paid for by the Contractor from the cash allowance established for purpose of inspecting and/or testing designated portions of Work, or directly by the Owner, as determined by the Consultant.

.2 Except as described below, where the Contractor pays for inspection and testing, costs and payments for such testing and inspection shall be shall be from the applicable cash allowances established in Section 01 21 01 Allowances and respective other Sections.

.3 Particular requirements for inspection and testing to be carried out by the designated testing laboratory are specified in the various sections of the specifications.

.4 Provide equipment required for executing inspection and testing by appointed

agencies.

.5 Coordinate inspections and testing with inspection and testing company. Uncover for examination any Work covered up prior to inspection or without approval of the Consultant. Make good such Work at no cost to the Owner.

.6 Employment of inspection/testing agencies shall not relax responsibility to perform Work in accordance with the Contract Documents.

.7 The following items are not included in cash allowances for testing and inspection and costs for same shall be included in the Contract Price:

.1 Inspection and testing required by laws, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Selected testing, adjustment and balancing of mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 Tests specified to be carried out by Contractor under the direction of the Consultant.

.6 Costs of retesting work found to be defective or deficient, after such work has been remedied.

.8 Products and work may be inspected and tested during manufacture, fabrication, storage, shop testing, installation, construction and testing phases of the Contract, as directed by the Consultant. The Consultant will ascertain the quantity and quality of testing to be performed. Provide access, proper facilities and assistance irrespective of location of inspection and testing.

1.6 Access to Work

.1 Allow inspection/testing agencies access to the Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

.3 Contractor's Responsibilities

.1 The Contractor shall:

.1 Provide equipment required for executing inspection and testing by appointed agencies. Facilitate inspections and tests.

.2 Co-ordinate with, and supply all materials for inspection and testing purposes as requested by the inspection and testing company.

.3 Make good work disturbed by inspection and testing.

.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

1.7 Procedures

.1 Notify the appropriate agency and Consultant in advance of the requirement for tests, in order that attendance arrangements can be made.

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

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

1.8 Rejected Work

.1 Refer to CCDC 2 - 2008, GC 2.4.

.2 If defects are revealed during inspection and/or testing, the 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 re-inspection.

1.9 Reports

.1 Submit 3 copies of inspection and test reports promptly to Consultant.

.2 Submit one copy of inspection and test reports promptly to the Owner.

.3 Submit one copy of inspection and test reports promptly to the local Building Department.

.4 Provide copies of inspection and test reports to Subcontractor of work being inspected/tested, and/or manufacturer/ fabricator of material being inspected/ tested.

1.10 Tests and Mix Designs

.1 Furnish test results and mix designs as may be requested.

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

1.11 Mock-ups

.1 Erect mock-ups as specified in respective specification sections on site for Consultant's review. Include for work of all Sections required to provide mock-ups. Re-execute mock-ups until accepted by the Consultant. Unless otherwise indicated accepted mock-ups may be incorporated into the Work, and shall be the standard to which all subsequent work of the same type shall be performed.

.2 Construct in locations as specified in specific Section. Where location not specified, obtain direction from Consultant.

.3 Prepare mock-up for Consultant review with reasonable promptness and in an orderly sequence, so as not to cause any delay in the Work.

.4 Provide minimum 7 working days notice to Consultant of mock-up readiness for review.

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

.6 Where mock-ups are not incorporated into the Work, retain mock-ups on site until all work addressed by the mock-up has been completed and accepted, then remove from site.

1.12 Mill Tests

.1 Submit mill test certificates as may be requested.

1.13 Equipment and Systems

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

.2 Refer to respective Sections for definitive requirements.

1.14 Manufacturer’s Field Review

.1 Where manufacturer’s field review is specified, manufacturer’s representative shall review the relevant parts of the work at the Place of the Work, or wherever such affected work is in progress, to ensure that work is being executed in accordance with manufacturer's written recommendations.

.2 Manufacturer’s field review is to ensure that the Products specified are being used in the Work and are being applied on surfaces prepared in accordance with

their recommendations and the requirements of the Contract Documents.

.3 Unless otherwise indicated, manufacturer's representative shall undertake a minimum of 1 field review, with additional reviews as deemed necessary by the manufacturer, to determine that the work of such sections is in accordance with the manufacturer's written recommendations.

.4 Manufacturer's representative shall submit a type-written report on manufacturer's letterhead within 2 Working Days after each field review. Report shall document manufacturer's representative's field observations and recommendations.

.5 Manufacturer's field review reports shall be prepared and distributed following the procedures specified for preparation and submittal of inspection and testing reports given above.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 52 01 -Temporary Facilities

.2 Section 01 57 01 - Temporary Controls

.3 The requirements of this Section apply to all other Sections of the specifications.

1.2 Installation, Maintenance and Removal

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

.2 Remove from site all such work after use.

.3 Maintain temporary utilities and plant in good operating order.

.4 Use utilities and execute work to prevent waste of utilities.

1.3 Dewatering

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 Sanitary Facilities

.1 Use of existing sanitary facilities in building accepted where Contractor maintains same to Owner's existing sanitary standard. Owner reserves right to designate which facilities in buildings are available for Contractor's use.

.2 Maintain in clean condition.

.3 Owner reserves the right to revoke use of designated existing facilities during construction period at no change in Contract Price. Where directed, provide sanitary facilities in accordance with legislation.

1.5 Water Supply

.1 The Owner will provide a continuous supply of potable water for construction use.

.2 Provide temporary connections to existing supply points, and pay all costs for installation, maintenance and removal.

1.6 Temporary Heating

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel (unless otherwise specified) for exterior work, or work exposed to exterior conditions, during construction period 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.

.2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders not permitted. Maintain fire watch during use of open flame heaters.

.3 Do not use electricity for temporary heating except with Owner's prior permission.

.4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress, unless indicated otherwise, or as may be required by manufacturer's instructions for materials being installed during heating period.

.5 Existing, permanent heating system of building, or portions thereof, may be used when available. Be responsible for damage thereto. Do not modify or alter existing system without written direction from Consultant, except that filters shall be installed and maintained clean at return air inlets and exhaust air inlets to prevent soiling of system.

.6 On completion of work for which permanent heating system is used as construction heating, replace permanent filters, and leave equipment clean.

.7 With Owner's permission, temporary connection may be made to natural gas service for construction purposes. Provide meter, and compensate Owner for cost of fuel consumed at Owner's costs. Obtain all necessary permits and inspections. Owner shall be final authority to determine costs. Provide all other piping, fittings, connections, hoses, etc. as required for temporary connection.

.8 Where work is solely renovation of an existing building, Owner will pay natural gas utility charges when temporary heat source is existing building equipment.

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

.10 Prevent excessive use or waste of utilities, and minimize utility costs to Owner.

.11 Maintain strict supervision of operation of temporary heating equipment to:
- .1 Conform to 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.

1.7 Temporary Ventilation

.1 Ventilate heated areas keep building free of exhaust or combustion gases.

.2 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.3 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

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

.5 Ventilate storage spaces containing hazardous or volatile materials.

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

.7 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
- .1 Conform to applicable codes and standards.
- .2 Enforce safe practices.
- .3 Prevent abuse of services.
- .4 Prevent damage to finishes.
- .5 Vent direct-fired combustion units to outside.

.8 New and existing equipment and systems shall not be used for temporary ventilating.

1.8 Temporary Power and Light

.1 The Owner will pay for temporary power during construction for temporary lighting and operating of power tools to maximum available supply. Site verify

available supply, including voltages, amperages and phases. Unless otherwise ascertained or verified, assume 110 volts, 15 amps, single phase available. Do not interrupt occupants' use of power when using power for construction purposes.

.2 Temporary power in excess of above is responsibility of Contractor unless otherwise agreed with Owner.

.3 Provide temporary connections to existing supply points, and pay all costs for installation, maintenance and removal. Make connections in accordance with Electrical Safety Code.

.4 Provide and maintain temporary lighting throughout project. Level of illumination on all floors and stairs shall not be less than 15 foot-candles (162 Lx).

.5 Do not use electricity to provide temporary construction heating except with prior permission of Owner.

1.9 Fire Protection

.1 Provide and maintain temporary fire protection equipment during performance of work required by governing codes, regulations and bylaws and by Owner's requirements.

.2 Open and burning rubbish are not permitted on site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 51 01 - Temporary Utilities.

.2 Section 01 57 01 - Temporary Controls.

.3 Section 01 74 01 - Cleaning

.4 The requirements of this Section apply to all other Sections of the specifications.

1.2 Use of Owner's Temporary Facilities

.1 Use of Owner's temporary facilities, such as portable ladders, work lights, extension cords, tools, etc. is prohibited. Contractor to provide all such items.

1.3 Installation and Removal

.1 Provide temporary construction facilities in order to execute work expeditiously.

.2 Maintain temporary facilities and plant in good operating order.

.3 Remove from site all such work after use.

1.4 Scaffolding

.1 Provide and maintain scaffolding, ramps, ladders, platforms, temporary stairs and other temporary access devices as required to complete the Work.

1.5 Hoisting

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

.2 Hoists and cranes shall be operated by qualified operator.

1.6 Elevators

.1 Use of existing elevators to move personnel and materials is prohibited without Owner's prior consent.

.2 Where elevator use is permitted, provide temporary protection to elevator finishes. Make good all damage arising from use of elevators.

1.7 Site Storage/Loading

.1 In accordance with CCDC 2 - 2008, GC 3.11.

.2 Confine work and operations of employees to limits indicated by Contract documents or where no limits shown on drawings, to immediate area of work. Do not unreasonably encumber premises with products.

.3 On-site storage of construction materials and equipment shall be kept to a minimum at all times. All materials being stored shall be protected by the Contractor from damage or loss and shall be repaired or replaced by the Contractor should damage or loss occur.

.4 Do not load or permit to load any part of work with a weight or force that will endanger the work, or any part of existing structures, components or elements.

.5 Do not store goods and materials within existing buildings except with Owner's prior permission. Materials are to be stored in a location and manner to cause the least interference with work activities, pedestrian or vehicular traffic.

.6 Where storage is not permitted within existing buildings, provide lockable sheds and trailers to store goods and materials. Pay parking costs associated with storage trailers.

.7 Determine with the Owner those locations that are suitable for receiving and

storage of materials and equipment.

.8 All materials and equipment shall be kept in a secure area, at contractor's expense, or removed from the job site when work is not actually in progress.

1.8 Construction Parking

.1 Except as noted below, pay costs of parking. Owner's available parking is subject to charge. Obtain schedule of available parking locations, rate schedule and permits from Owner's Parking Services, Trent Lane.

.2 Parking costs will apply to office and/or storage trailers occupying parking spaces.

.3 Parking within construction hoarding is without charge. Owner reserves right to approve extent of hoarding. Owner's requirements take precedence over Contractor's use of site.

1.9 Security

.1 For unoccupied buildings, ensure that buildings are maintained locked at all times, except when doors are unlocked and continuously monitored by Contractor.

.2 For occupied buildings, cooperate with Owner's schedule of unlocking and locking. Maintain locking schedule unless otherwise directed by Owner. Continuously monitor all doors unlocked at periods when Owner would normally maintain locked doors.

.3 Comply with Owner's security requirements.

.4 Refer also to other sections for security provisions during periods when building systems (e.g., fire alarm) are out of service.

.5 Comply with Owner's directives regarding security of existing buildings.

.6 See also other Sections, in particular Section 01560 Temporary Controls.

1.10 Offices

.1 Provide and maintain in clean condition during progress of work, adequately lighted, heated and ventilated temporary Contractor's office with space for filing and layout of Contract Documents and Contractor's normal site office staff. At Owner's discretion, portions of existing building may be used for these purposes. Where site offices use existing parking, pay parking fees required. Notwithstanding the above, but subject to applicable legislation, site offices are not required for Work with Contract Price of less than $300,000.

.2 Provide adequate required aid facilities.

.3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

1.11 Equipment, Tool and Materials Storage

.1 Materials may be stored in building subject to other requirements regarding overloading structure and Owner's ongoing use.

.2 Where materials cannot be stored in building, provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.3 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.12 Waste Disposal Containers and Services

.1 Provide for garbage chutes, on-site debris collection and disposal equipment, and services needed to dispose of all debris. Do not use Owner's waste containers

for disposal of debris arising from work of this Contract. Provide and pay for dedicated waste disposal for work of this Contract.

1.13 Construction Sign

.1 The minimum sign requirements shall be:

.1 Provide within two (2) weeks of signing Contract, and prior to submitting first claim for payment, minimum 11” x 17” G1S plywood sign, complete with wood framing and supports, showing University’s cornerstone logo; listing project title, Owner’s project number, name of Owner’s representative (Construction Co-ordinator) complete with telephone extension, consultant and contractor complete with name and address for all; sign background and rear face of sign shall be white; letters for names to suite sign height, black paint; typeface as respective corporate standard; provide logo for each firm listed, in corporate colour. Provide adequate vertical space between parties. Submit sign sketch for Consultant's approval before fabrication. At Contractor's discretion, subcontractors may be listed on the construction sign, space permitting. Sign shall be executed with exhibit lettering produced by a professional sign manufacturer/painter.

.2 Locate sign as directed by Consultant and with Owner’s consent.

.3 Supplement sign in paragraph 1.13.2. with signs as 1.13.1 in occupied premises.

.2 Maintain sign in good condition for duration of work. Clean periodically. Remove immediately after Substantial Performance of the Contract, or at Completion of Contract as defined in applicable lien legislation where there is no application for Substantial Performance of the Contract.

.3 No other signs or advertisements, other than warning signs, or signs required by law, are permitted on site, without Owner's consent.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 14 01 Special Project Requirements.

.2 Section 01 61 01 Material and Equipment.

.3 Individual Product Sections: cutting and patching incidental to work of the Section. Advance notification to other Sections required.

.4 The requirements of this Section apply to all other Sections of the specifications.

1.2 Submittals

.1 Approvals
- .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.

1.3 Materials

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 61 01.

1.4 Preparation

.1 Inspection
- .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.

.2 Provide supports to assure structural integrity of surroundings. Provide devices and methods to protect other portions of project from damage.

.3 Provide protection from elements for areas that may be exposed by uncovering work; maintain excavations free of water.

1.5 Special Procedures: Concrete Cutting and Coring

.1 Prior to cutting or coring any concrete slab, suspended or on grade, or any concrete beam, investigate by telemetrically scanning the element for presence of embedded services (piping, cabling, conduit, etc.), and for locations of reinforcing steel in suspended concrete slabs and beams.

.2 Acceptable telemetric scanning systems include:
.1 (Ground-penetrating) radar for slab on grade, for suspended slabs and for concrete beams.

.3 Magnetic radio scanners not acceptable for telemetric scanning.

.4 Provide Owner and Consultant with inspection agency's written report, summarizing investigations and conclusions.

.5 Obtain Consultant's direction where investigations reveal that cutting or coring required in Contract would cut or damage embedded services, or cut or damage reinforcing steel in suspended concrete slabs or beams.

.6 Execute cutting and coring to prevent damage to all embedded services. Make good all damage arising from cutting embedded services.

.7 Execute cutting and coring to prevent damage (cutting in whole or in part) reinforcing steel in suspended concrete slabs without Consultant's prior authorization.

.8 Make good all damage arising from cutting reinforcing steel in suspended concrete slabs and beams.

1.6 Execution

.1 Perform cutting, fitting, and patching including excavation and fill, to complete the Work. Perform work to avoid damage to other work.

.2 Fit the 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 new 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 acceptance of Consultant.

.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 fire stop, seal voids and penetrations as specified elsewhere, 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.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

PART ONE – GENERAL

1.1 Related Sections

.1 Section 00 73 01 Supplementary Conditions.

.2 Section 01 11 01 General Requirements.

1.2 Site

.1 Lines, Levels, and Locations for Building as per Site Plan.

.2 Lay out Work with reference to building and as shown on Drawings.

.3 Verify grades, lines, levels and dimensions indicated and report any errors or inconsistencies to Project Manager before commencing work. Confirm job dimensions at once to allow prompt checking of Shop and Other Drawings.

.4 Locate and fix locations of walls, partitions, shafts and all parts of the construction, as work proceeds.

1.3 Building Dimensions

.1 Prior to undertaking construction, the Contractor shall be responsible for determining from measurements taken at the Place of the Work the exactness of unconfirmed dimensions. If required, the Contractor shall obtain and pay for the services of a licensed Ontario Land Surveyor to ascertain and determine unconfirmed dimensions. Once established, the Contractor shall provide the Consultant with the results. Also, in consultation with the Consultant, the Contractor shall determine if adjacent dimensions are affected. If they are, the Consultant shall adjust same to comply with dimensions obtained at the Place of the Work. Such determinations shall not affect the Contract Price.

.2 Ensure necessary job dimensions are taken and trades are coordinated for accuracy and completeness of such dimensions and for coordination.

.3 Verify that Work as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent Work, as set out by requirements of the Drawings, and ensure that Work installed in error is rectified before construction continues.

.4 Check and verify dimensions referring to Work and interfacing of services. Dimensions, when pertaining to the Work of other Trades, shall be verified with the Trade concerned. Ensure that Subcontractors from various Trades cooperate for the proper performance of the Work.

.5 Do not scale directly from drawings. If there is ambiguity or lack of information, immediately inform Project Manager. Any change through disregarding of this clause to be the responsibility of Subcontractor concerned.

.6 All dimensional changes resulting from the above shall be noted on the Contractor's as-built drawings.

.7 All details and measurements of any Work which is to fit or to conform to Work installed shall be taken at the Site.

.8 Where verified and determined dimensions from the Place of the Work are required in the preparation of Shop Drawings, the Contractor shall determine the exactness of the dimensions prior to the preparation of these drawings.

1.4 Layout and Survey

Lines, Levels, and Locations for Building

.1 Existing grades, lines, and site conditions shown on Drawings were taken from survey information established by persons engaged directly by Owner. The

accuracy of survey information is not the Owner's responsibility.

.2 The Contractor will establish location of property lines. The Contractor shall establish necessary lines and levels, and provide batter boards and other means to control the accurate positioning of all building elements.

.3 Employ an Ontario Land Surveyor to:

.1 Lay out building on site.

.2 Verify elevations of floor levels as construction proceeds, and relate to bench mark datum.

.3 Verify that present, or known future restrictions, are not violated by construction on the site or lines of traverse to all public utilities.

.4 Correlate geodetic elevation of bench mark datum with elevations in use by public utilities adjacent to Project.

.5 Provide a survey to verify location of building on site.

.4 Survey Requirements: Where the work consists of an addition or extension of an existing building, or a new building, provide a survey, undertaken by an Ontario Land Surveyor, referencing the foundation and exterior walls to adjacent site features, including: existing buildings, roads, walks, trees, hydrants, and light fixtures. Submit 3 hard copies of plan of survey and 1 digital copy in AutoCAD format.

.5 Preserve permanent reference points during construction. Report to Consultant when a reference point is lost or destroyed, or requires relocation due to necessary changes in grade or location.

.6 Establish lines and levels, locates and lay out by instrumentation.

1.5 Utility and Site Services Locates

.1 Employ an Ontario Land Surveyor to:

.1 Locate by whatever means necessary, all existing services and utilities that cross or enter the Place of the Work.

.2 Lay out all existing services and utilities on site with stakes, flags and paint.

.3 Verify elevations of levels all existing services and utilities and relate to bench mark datum.

.3 Verify that present, or known future restrictions, are not violated by construction on the site or lines of traverse to all public utilities.

.4 Correlate geodetic elevation of bench mark datum with elevations in use by public utilities adjacent to Project.

.5 Document, clearly on a copy of the site plan, the locations and elevations of all existing services and utilities and provide a copy of the documentation with other as-built documentation.

1.6 Drainage

.1 Ensure that positive drainage is provided to roof, floor, and site drains and catch basins, as set in their final positions. Provide constant slopes for drained surfaces to drains and drainage courses.

.2 Ensure that allowable construction tolerances and structural tolerances do not permit ponding of water.

.3 Verify the extent of each area served by a drain, or drainage course, to eliminate possible un-drained surfaces. Coordinate the work of involved trades before each proceeds.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 51 01 Temporary Utilities

.2 Section 01 52 01 Temporary Facilities

.3 The requirements of this Section apply to all other Sections of the specifications.

1.2 Installation and Removal

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

.2 Maintain temporary controls and plant in good operating order.

.3 Remove from site all such work after use.

1.3 Guards and Hoarding

.1 Comply with stricter of applicable legislation or the following.

.2 Erect guards and other barricades to protect all persons, public and private property from injury or damage.

.3 Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to building.

.4 Provide barriers around trees and plants designated to remain. Protect from damage.

.5 Erect signs to prohibit entry of unauthorized personnel into work areas, particularly when building remains occupied by the Owner.

.6 Erect walkways, hoarding, guards, or other protective measures and directional devices required to provide persons with safe access to the building. Temporary accesses shall permit persons to have access to the buildings over excavated areas by means of duckboards or other suitable measures to keep persons free of mud or other tracking and soiling substances. Temporary lighting to a minimum level of 20 footcandles shall be provided for lighting of the walkways at all times.

.7 Provide hoarding at all exterior work areas, including but not limited to outdoor storage areas, garbage bins, below all exterior work operations above grade, and at other hazardous exterior work areas, and as may be indicated. Unless otherwise indicated, or as otherwise agreed with the Owner and as may be required by legislation, acceptable exterior hoarding shall be minimum 6' high, and be galvanized steel fence, or plywood on wood framing. "InstaFence" (905) 662-3956 portable fencing will be accepted as galvanized fencing in place of fixed galvanized fencing. Panels must be provided with T base suitable for pinning and shall be clipped together at top corners. Contractor remains solely responsible for site security and safety and shall supplement these requirements as necessary. Erect hoarding as required to protect all persons, and all public and private property from injury and damage. Ensure conformance with all requirements of authorities having jurisdiction.

.8 Provide hoarding and dust control measures at interior work areas as the project requires, contractor to account for proper access to areas of the building as the project requires. Unless otherwise indicated, or as otherwise agreed with the Owner and as may be required by legislation, acceptable interior hoarding shall be ply-wood sheathing screwed to steel studs or other acceptable framing/supports.

.9 Where required, provide lockable gates/doors within hoarding for access. Ensure that requirements for exiting /egress from the area are maintained and

provide panic hardware as required.

.10 Assume full responsibility for any damage or injury caused due to failure to comply with provisions of the Contract Documents.

1.4 Guard Rails, Barricades and Warning Notices

.1 Provide and maintain all required signage, construction barriers, dust screens etc. to adequately restrict and protect the public from the work site and the work being undertaken.

.2 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs, and as otherwise required by governing authorities.

.3 Wherever the Contractor's work may expose persons to danger, provide all necessary protection to prevent injury and post notices advising of the hazard.

1.5 Security and Weather Enclosures

.1 In addition to the requirements of other Sections, provide weathertight closures to unfinished door and window openings, tops of shafts and other openings in floors, walls, and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work area for temporary heat. Weather enclosures shall be sufficient to maintain Owner's customary interior environment.

.3 Where the existing building envelope is opened, breached, or otherwise compromised by work of this Contract, possibly permitting entry of wind or precipitation into the building, or possibly adversely affecting usual interior temperatures and humidity, provide temporary weathertight and dust-tight enclosures and protection for exterior openings made until permanently enclosed.

.4 Where the existing building envelope is opened, breached, or otherwise compromised by work of this Contract, reducing or adversely affecting the Owner's normal level of security, install temporary closures to prevent unauthorized entry and maintain Owner's usual level of security until the exterior openings permanently enclosed.

.5 Where existing interior partitions that afford security to the Owner's personnel and chattels are opened, breached, or otherwise compromised by work of this Contract, reducing or adversely affecting the Owner's normal level of security, install temporary closures to prevent unauthorized entry and maintain Owner's usual level of security until the openings permanently enclosed.

1.6 Dust Tight Screens

.1 In addition to the requirements of other Sections, provide dust tight screens or partitions to localize dust-generating activities, and for protection of workers, finished areas of Work, Owner, building occupants, and public. Prevent migration of dust to adjacent areas of the building, especially occupied areas, and into other buildings. Construct dust barriers prior to starting any demolition or construction work.

.2 Provide dust screens, covers, cloths, or other appropriate dust protection to keep surfaces, furnishings, equipment, fittings, and occupants' personal effects remaining in work spaces during work, completely free from dust and debris arising from the Work. Dust barriers shall be full height and be sealed to floors, ceilings and walls. Maintain protection for the full extent of the renovation work.

.3 Install temporary filters to existing mechanical grilles, louvers, exhausts, etc., unless the Owner has consented to disconnect the equipment involved in which

case seal off with temporary plastic sheet dust barriers.

.4 Use fans to maintain appropriate positive/negative pressure to limit migration of dust outside barriers.

.5 Maintain and relocate protection until such Work is complete. Remove upon completion of dust-generating work, and make clean areas affected.

1.7 Odour Control

.1 Where work, such as painting, asphalting or roofing, adhesives will generate odours, take all necessary measures to limit migration of odours outside immediate work area and limit effect on Owner's operations.

.2 Acceptable measures include working outside normal working hours to permit smells to dissipate by the time Owner's personnel return to work, extending ductwork. Only as a last resort, and the absence of any other acceptable measure, arrange shutdown of Owner's air handling equipment, and/or Owner's operations.

1.8 Noise Control

.1 Take all efforts to limit adverse impact of noise generating operations on Owner's ongoing use of building and adjacent areas.

.2 Be advised that low frequency vibrations, in particular, such as those from coring and drilling, transmit throughout structures.

.3 Execute work that creates excessive noise unacceptable to the Owner shall be performed outside the Owner's normal working hours as determined by the owner, and such work shall be included in Contract Price.

1.9 Access to Site

.1 Use existing driveways, roads, parking areas, and sidewalk crossings as may be required for access to the work.

.2 Maintain reasonable access at all times to all buildings, roads, walkways, service roads and adjacent parking areas.

.3 Arrange with the Owner for use of building loading docks, where applicable.

.4 Protect existing driveways, roads, parking areas and sidewalk crossings from damage, and make good damage arising.

.5 Keep public roads clean of soiling. Clean as required.

1.10 Public Traffic Flow

.1 Provide and maintain notices, flagpersons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.

1.11 Protection for Off-Site and Public Property

.1 Protect surrounding private and public property from damage during performance work.

.2 Be responsible for damage incurred.

1.12 Protection of Building Finishes and Equipment

.1 Provide protection for finished and partially finished building finishes, furniture and equipment during performance of work.

.2 Provide necessary screens, covers, and hoardings as required.

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

.4 Furnishings and Equipment Relocation and Protection:

.1 Unless otherwise indicated, the Owner will not remove portable furnishings and equipment from the work area to suit work of this Contract. Protect and keep safe all chattels remaining in place.

.2 Subject to the Owner's approval, furnishings and equipment may be relocated by the Contractor to other areas of the facility in which work occurs. Contractor to protect and relocate these furnishings and equipment to suit work. Return furnishings and equipment to original location when location ready to receive furnishings.

.3 Protect all finishes, furnishings, fittings, equipment, occupants' effects, etc. from damage and soiling. Protect building, equipment, furnishings and remaining in or adjacent to any area in which work is occurring as required, and as specified elsewhere. Make good all damage to the satisfaction of the Owner. Erect dust protection as needed to maintain existing building clean of all disruption and debris from work of this Contract.

.5 Provide 6 mil polyethylene coverings to prevent soiling of complex surfaces and compartments. Tape polyethylene in place. Provide additional protection to prevent other damage where required. This includes but is not limited to using plywood or OSB sheets to prevent impact damage. Fastening shall not damage elements being protected.

.6 At wall murals, plaques, display cabinets, and other elements of significance in rooms in which work will occur, provide temporary protection consisting of 6 mil polyethylene dust protection and minimum 1/2" OSB impact protection, secured to wood framing and blocking. Fastening shall not damage elements being protected. Protection shall remain in place until all adjacent work is complete.

.7 Provide all necessary protection to furnishings and chattels that remain in place during the Work. Use 6 mil polyethylene coverings, movers' quilts, OSB, etc., as required. Prevent all damage.

1.13 Garbage Chutes

.1 Debris shall not be allowed to free-fall from openings in the building's exterior walls. Provide garbage chutes in compliance with applicable legislation where debris from upper floors is dropped from the building. Existing windows may be removed and re-installed to suit this requirement, subject to maintaining weather and security protection.

1.14 Lockout Procedures

.1 All work to be done on systems or machinery, where the unexpected switching on or off of the system or machinery could result in personal injury, shall be done in accordance with the Contractor's standard lockout procedure. The Contractor shall provide his/her own locks for the above procedure. At a minimum, lock out procedures shall consist of switches padlocked in off position, and tagged to advise of inadvertent operation.

.2 Where there is risk of injury to both the Owner's and the Contractor's personnel due to equipment re-activation, double lockout procedures shall be employed, with each of the Contractor and the Owner providing separately keyed locks and tags to the switches. Do not remove locks and tags until each party's responsible has:

.1 independently ascertained that no injury will be caused to personnel by re-activating the equipment;

.2 verified to the other party that no injury will be caused to personnel by re-activating the equipment.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 General requirements: Section 01 11 01 General Requirements.

.2 Cleaning: Section 01 74 01 Cleaning

.3 The requirements of this Section apply to all other Sections of the specifications.

1.2 Fires

.1 Fires and burning of rubbish on site not permitted.

1.3 Disposal of Wastes

.1 Do not bury rubbish and waste materials on site. Dispose of waste materials in accordance with Section 01 74 01 Cleaning and Section 01 52 01 Temporary Facilities.

.2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers. Dispose of hazardous waste or volatile materials in accordance with Article 1.28 of Section 01 11 01 General Requirements

1.4 Drainage

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.2 Do not pump or permit water containing suspended materials into waterways, sewer or drainage systems.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 Plant Protection

.1 Protect trees and plants on site and adjacent properties.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 6'-6" (2 m).

.3 Protect roots of designated trees to dripline during work to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

1.6 Pollution Control

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant to local authorities emission requirements.

.3 Prevent material from sandblasting, chipping, grinding and other similar operations from contaminating air beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for all operations relating to work of this contract.

1.7 Indoor Air Quality Management During Construction

.1 HVAC Protection

.1 Prevent dust from settling into HVAC system. Seal off any duct work during construction and then keep ducts sealed in plastic to prevent

.2 Do not use HVAC system during construction.
.3 Do not store construction or waste materials in mechanical rooms.
.4 Seal diffusers and grilles with plastic.
.5 Inspect and clean all ducts, diffusers and grilles at completion of the Work.

.2 Source Control
.1 Prohibit the idling of motors and internal combustion engines on site during construction.
.2 Use bottled gases for equipment rather than diesel.
.3 Switch to electrical equipment rather than fossil fuel equipment wherever possible.
.4 Ensure any exhaust is emitted directly to the exterior and well away from any intakes or door or window openings.
.5 Use enclosed tankers rather than open kettles for roofing operations.

.3 Work Area Separation
.1 Use dust curtains, continuous heavy duty sheet plastic seals and hoarding to separate work areas containing any dust and dirt particulates from other parts of the building.

.4 Housekeeping
.1 Minimize dust with wetting agents or sweeping compounds.
.2 Remove spills quickly when dealing with odorous or noxious materials.
.3 Remove any accumulated water. Keep all work areas dry and dehumidify when and where necessary.
.4 Vacuum with HEPA filtered vacuums to reduce airborne dust particles.
.5 Keep porous materials dry. Do not allow any insulation to become wet.
.6 Clean site daily.

.5 Scheduling
.1 If the building is occupied after substantial completion, on-going work areas are to be kept under negative pressure to prevent the mitigation of dust and dirt into the occupied spaces.
.2 Wherever possible, work, where off-gassing occurs is to be scheduled during off-hours.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 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.

1.2 Reference Standards

.1 Within the text of each specifications section, reference may be made to reference standards. List of standards reference writing organizations is contained in Section 01 42 00 - References.

.2 Conform to these reference standards, in whole or in part as specifically required 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 borne by Owner in event of conformance with Contract Documents or by Contractor in the event of non-conformance.

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

1.3 Quality

.1 The Contractor shall ensure all materials are delivered to the site in original containers and packages with labels and seals intact and that they are protected from the elements.

.2 The Contractor shall use all products in strict accordance with the manufacturers' directions unless specifically directed otherwise by the Consultant. Whenever reference to manufacturers' directions or instructions is included in the Specifications, the Contractor shall submit copies of such instructions or directions for review by the Consultant before commencing the relevant Work.

.3 When requesting approval for the use of substitutions, the Contractor shall clearly identify any effect(s) that the proposed substitution may have on the Contract Price and Contract Time.

.4 Products which are specified by their proprietary names, or by part or catalogue number, shall form the basis for the Contract and Specifications. No substitutions for these products may be used without the Consultant's prior written approval. Substitutions will be considered for approval ONLY under the following circumstances:

.1 when documentation is submitted to permit sufficient time for adequate review by the Consultant and

.2 it can be demonstrated to the Consultant's satisfaction that the substitution is equal to the specified product and

.3 the request for substitution is accompanied by a detailed list of properties of both the specified product and the proposed substitute for comparison.

.5 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.

.6 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.

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

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

.9 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.

1.4 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 maybe 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, Owner reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 Storage Handling and Protection

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

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

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

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

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

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

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

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

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

1.6 Transportation

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

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

1.7 Manufacturers' 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 reinstallation at no increase in Contract Price or Contract Time.

1.8 Quality of Work

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify 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. Owner 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.

1.9 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.

1.10 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.

1.11 Remedial Work

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable.

.2 Coordinate adjacent affected Work as required. Perform remedial work by specialists familiar with Materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.12 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.

1.13 Fastenings

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metal and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.14 Fastenings - Equipment

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

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

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

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

1.15 Protection of Work in Progress

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

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

PART ONE - GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Requirements

.2 Section 01 45 01 - Quality Control: Quality control and inspection of Work.

.3 The requirements of this Section apply to all other Sections of the specifications.

1.2 Reference Standards

.1 Within the text of the specifications, reference may be made to the following standards:

.1	ACI	American Concrete Institute
.2	AISC	American Institute of Steel Construction
.3	ANSI	American National Standards Institute
.4	ASTM	American Society of Testing and Materials
.5	CEC	Canadian Electrical Code (published by CSA)
.6	CEMA	Canadian Electrical Manufacturer's Association
.7	CGSB	Canadian General Standards Board
.8	CISC	Canadian Institute of Steel Construction
.9	CLA	Canadian Lumberman's Association
.10	CPCA	Canadian Painting Contractors' Association
.11	CSA	Canadian Standards Association
.12	FM	Factory Mutual Engineering Corporation
.13	IEEE	Institute of Electrical and Electronic Engineers
.14	IPCEA	Insulated Power Cable Engineers Association
.15	OBC	Ontario Building Code
.16	OESC	Ontario Electrical Safety Code
.17	ESA	Electrical Safety Authority
.18	NEMA	National Electrical Manufacturers' Association
.19	ULC	Underwriters' Laboratories of Canada
.20	TSSA	Technical Standards and Safety Authority

.2 Conform to these standards, in whole or in part as specifically requested in the specifications.

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

.4 The cost for such testing will be borne by the Owner in the event of conformance with Contract Documents or by the Contractor in the event of non-conformance.

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

1.3 Quality

.1 In accordance with CCDC 2 - 2008, GC 3.8.

.2 If requested, furnish evidence as to type, source and quality of Products provided.

.3 Defective Products, whenever identified prior to the completion of Work, will be rejected, regardless of previous inspections or reviews. Review by the Consultant or inspection by designated testing and inspection agencies does not relieve the Contractor of responsibility for execution of the Work, but is a 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 the quality or fitness of Products, the decision rests strictly with the Consultant based upon the requirements of the Contract Documents.

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

.7 Products, which are specified by their proprietary names, or by parts or catalogue number, shall form the basis for the specifications and the Contract. No substitutes for these products may be used without the Consultant's approval in writing. Substitutes will be considered only when submitted in sufficient time to permit proper investigation by the Consultant.

.8 In applying for permission to use substitutes, the Contractor shall prove to the Consultant's satisfaction that the substitute meets or exceeds the characteristics of the specified product. Each application shall be accompanied by a list of properties of the specified product and the proposed substitute. When requesting approval for the use of substitutes, the Contractor shall include in his submission any effect that the substitution may have on the Contract Price and Contract Time. No application to use substitutes will be considered unless made in this way.

.9 Whenever more than one product is specified for use, the Contractor may use any of the products so specified unless the drawings or specifications indicate otherwise.

.10 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

1.4 Availability

.1 In submitting Bid, Contractor warrants that all materials are available in suitable time to meet Contract dates.

.2 Subject to sentence .3 below, where the Contractor advises that the Contractor cannot supply materials in suitable time to meet Contract dates, and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to substitute more readily available products of similar character, even if more costly to the Contractor, at no increase in Contract Price.

.3 Where the Contractor can show that the Contractor promptly ordered the originally specified materials the Owner will pay the differential in cost between the originally specified material and the substitute material with out any mark-ups applicable by the Contractor, subcontractors, subsubcontractors or suppliers. For greater certainty, the Contractor’s failure to submit shop drawings or other submittals or seek direction in those instances where the Contract Documents so require in sufficient time to permit ordering materials is not cause for the Owner to pay the cost differential in sentence .2 above.

1.5 Storage, Handling and Protection

.1 Handle and store Products in a 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 the 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 on flat, solid supports and keep clear of ground. Slope to shed moisture.

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

.8 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site. Remove and replace damaged Products at own expense and to the satisfaction of the Consultant.

.9 Touch-up damaged factory finished surfaces to Consultant’s satisfaction. Use primer or enamel to match original. Do not paint over nameplates.

1.6 Transportation

.1 Pay costs of transportation of Products required in the performance of Work.

.2 The Owner will pay for transportation cost of Products supplied by the Owner. Unload, handle and store such Products.

1.7 Manufacturer's Instructions

.1 Unless otherwise indicated in the 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 the Consultant in writing, of conflicts between the specifications and manufacturer's instructions, so that the Consultant may establish the course of action.

.3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes the Consultant to require removal and re-installation at no change in Contract Price or Contract Time.

1.8 Workmanship

.1 Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required Work is such as to make it impractical to produce required results.

.2 Do not employ any unfit person or anyone unskilled in his or her required duties. The Consultant reserves the right to require the dismissal from the site workers

deemed incompetent, careless, insubordinate or otherwise objectionable.

.3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant, whose decision is final.

1.9 Co-Ordination

.1 Insure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 Concealment

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform the Consultant if there is a contradictory situation or uncertainty regarding means of concealment. Install as directed by Consultant.

.3 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.4 Before installation, inform the Consultant if there is a contradictory situation. Install as directed by Consultant

1.11 Remedial Work

.1 Refer to CCDC 2 - 2008, GC 3.12

.2 Perform remedial work required to repair or replace the parts or portions of the Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.3 Perform remedial work by specialists familiar with the materials affected. Perform in a manner to neither damage nor endanger any portion of Work.

.4 Where factory finishes are marred or scratched, and with Consultant's acceptance, touch up scratched factory finishes with manufacturer's recommended paint system or repair technology.

1.12 Location of Fixtures

.1 Consider the location of fixtures, outlets, and mechanical and electrical items indicated or specified as approximate.

.2 Inform the Consultant of a conflicting installation. Install as directed.

.3 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

.4 Review with Consultant and Owner locations of related installations such as trenches, drains, equipment bases, etc., prior to installation.

.5 Where job conditions require reasonably changes in indicated locations and arrangements, make changes at no change to the Contract Price. Similarly, where existing conditions interfere with new installation and require relocation, include such relocation in the work of this Contract. Install and arrange fixtures and equipment to maintain maximum headroom and space.

1.13 Fastenings

.1 Provide permanent fastenings, anchors, adhesives and accessories required for performance of the work in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Provide exposed metal fastenings and accessories of same texture, colour and finish as base metal in which they occur, unless otherwise indicated.

.3 Prevent electrolytic action between dissimilar metals.

.4 Use noncorrosive fastenings, anchors and spacers for securement of exterior work or forming part of concealed work, which may be subject to corrosion. Use stainless steel or other material as specified in particular specification Sections.

.5 Fastenings, anchors, accessories and adhesive shall be of appropriate type and of sufficient quantity and in such a manner as to provide positive permanent anchorage of the unit to be anchored in position. Install anchors at spacing within limits of load bearing and shear capacity to accommodate applied loads so that the secured unit cannot work loose, fall, or shift out of position. Ensure fastenings, anchors, accessories and adhesives provide positive permanent anchorage.

.6 Keep exposed fastenings to a minimum, evenly spaced and neatly laid out. Conceal fasteners where indicated.

.7 Use of wood or other organic plugs prohibited.

.8 Fasteners which cause spalling or cracking of material to which anchorage is being made are prohibited.

.9 For equipment fastening, use fasteners of standard commercial sizes and patterns with material and finish suitable for service. Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 Protection of Work in Progress

.1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by the Consultant, at no increase in Contract Price.

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

1.15 Existing Services and Utilities

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities and Owner, with a minimum of disturbance to Work, building occupants and pedestrian and vehicular traffic.

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

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Requirements.

.2 Section 01 57 01 Temporary Controls.

.3 The requirements of this Section apply to all other Sections of the specifications.

1.2 General

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

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

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

.4 Prevent accumulation of wastes that may create hazardous conditions.

.5 In the event of any dispute regarding the removal of waste products, debris, tools, equipment, etc. the Owner may remove the waste product and debris and charge the cost to the Contractor, by means of deduction from monies owing the Contractor, to the extent that the Consultant shall determine to be just.

1.3 Project Cleanliness and Progressive Cleaning

.1 Maintain the Work in tidy condition, free from accumulation of waste products and debris, other than that caused by the Owner or other Contractors. Clean areas where work is being performed on a daily basis.

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

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

.4 Clean work area(s) upon completion of each day's work, and maintain areas free of dust and other contaminants during finishing operations. On a daily basis maintain project site and public properties free from debris and waste material.

.5 Provide for garbage chutes, on-site debris collection and disposal equipment, and services needed to dispose of all debris. Do not use Owner's waste containers for disposal of debris arising from work of this Contract. Provide and pay for dedicated waste disposal for work of this Contract.

.6 Remove waste materials and rubbish from site and dispose of at legal dumping areas. Pay all disposal costs.

.7 Clean interior areas prior to finish work, furniture move-in and final clean prior to occupancy, maintain areas free of dust and other contaminants during finishing operations.

.8 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer, and as compatible with Owner's cleaning systems for existing surfaces.

.9 Vacuum clean with commercial type vacuum interior building areas when ready to receive flooring and finish painting. Continue vacuum cleaning on an as-needed basis until work is complete.

.10 Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

.11 On a daily basis clean all areas dirtied by Work of this Contract to suit the Owner's continuing use and occupancy during construction.

.12 Where walks and roads are soiled by work of this Contract:

.1 At a minimum, weekly sweep and wash Owner's roads and walks soiled by work of this Contract. Sweep and wash roads and walks more frequently where soiling may be tracked into adjacent buildings. Sweep and wash public roads and walks weekly, at a minimum, and more frequently as required by local municipality.

1.4 Cleaning

.1 Where work is sequenced or phased, and upon completion of work in each floor, or part of each floor area, clean rooms or spaces affected by work of this Contract.

1.5 Final Cleaning

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

.2 Remove waste products and debris other than that caused by the Owner, other contractors or their employees, and leave the Work clean and suitable for the occupancy by Owner.

.3 When the Work is complete, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner or other Contractors.

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

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

.6 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

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

.8 Vacuum clean and dust building interiors, behind grilles, louvers and screens. Wet mop hard floors to remove all dust.

.9 Clean hard floor finishes, as recommended by the floor and cleaner manufacturer, and as compatible with Owner's floor maintenance products. Apply minimum 2 coats sealer followed by 2 coats of floor finish. Owner will supply materials for these treatments.

.10 Where work of this Contract damages existing sheet or tile floor finishes, repair

floor, then clean seal and finish floor, as recommended by the floor and cleaner manufacturer, and as compatible with Owner's floor maintenance products. Owner will supply materials for these treatments.

.11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation. Correct deficiencies.

.12 Broom clean and wash exterior walks and steps and similar surfaces; rake clean other surfaces of grounds.

.13 Remove dirt and other disfiguration from exterior surfaces.

.14 Clean and sweep roofs, gutters, downspouts, and drainage systems, areaways, sunken wells.

.15 Sweep and wash clean paved areas.

.16 Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections – Section Includes

.1 Text, schedules and procedures for systematic Waste Management Program for construction, deconstruction, demolition, and renovation projects, including:

.1 Diversion of Materials.
.2 Canadian Governmental Responsibility for the Environment Resources Schedule C.

1.2 Definitions

.1 Recyclable: Ability of product or material to be recovered at end of its life cycle and remanufactured into new product for reuse by others,

.2 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred in to new products.

.3 Recycling: Process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using unaltered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.4 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from remodelling 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.

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

.4 Separate Condition: Refers to waste sorted into individual types.

.5 Source Separation: Act of keeping different types of waste materials separate beginning from first time they become waste.

1.3 Waste Processing Plants

.1 Contact Ontario Ministry of Environment and Energy at 1(800)565-4923 to identify suitable waste processing sites.

1.4 Storage Handling and Protection

.1 Store, materials to be reused, recycled and salvaged in locations as directed by General Contractor.

.2 Unless specified otherwise, materials for removal do not become Contractor's property.

.3 Protect, stockpile, store and catalogue salvaged items.

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.5 Protect surface drainage, mechanical and electrical from damage and blockage.

.6 Separate and store materials produced during dismantling of structures in designated areas.

.7 Prevent contamination of materials to be salvaged and recycled and handle

materials in accordance with requirements for acceptance by designated facilities.

.1 On site source separation is recommended.
.2 Remove comingled materials to off-site processing facility for separation:
.3 Provide way bills for separated materials.

1.5 Disposal of Waste

.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.

1.6 Scheduling

.1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.1 Application

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

.2 Suspected termite infested material to be stored in bags or enclosed dumpsters and delivered to a designated facility certified for proper waste management of termites.

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 Separate recyclable materials from general waste stream and stock pile in separate piles or containers, as reviewed by Consultant, and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas.

.2 Provide instructions on disposal practices.

.3 On site sale of reusable or recyclable materials is not permitted.

3.4 Canadian Government Departments Chief Responsibility for the Environment

.1 Schedule C - Government Chief Responsibility for the Environment

Province	Address	General Inquiries	Fax
Ontario	Ministry of Environment and Energy, 135 St. Clair Avenue West, Toronto, ON M4V IP5	(416) 323-4321 (800) 565-4923	(416) 323-4682
	Environment Canada Toronto	(416) 734-4494	

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 29 01 Changes, Payments and Certificates

.2 Section 01 74 01 Cleaning

.3 Section 01 54 03 Field Engineering

.4 The requirements of this Section apply to all other Sections of the specifications.

1.2 Progressive Cleaning

.1 Refer to Section 01 74 01 Cleaning

1.3 Review/Take-over Procedures

.1 Review/Takeover Procedures

.1 In accordance with OAA/OGCA Document 100, latest edition, except where specified otherwise.

.2 In OAA/OGCA Document 100, where the term "Architect" is used, substitute the term "Consultant", and where the term "inspection" is used in relation to the Consultant's assessment of the Work, substitute the term "review".

.2 Arrange and pay for review by local authorities to obtain permission to occupy/occupancy permit (where applicable) prior to requesting Substantial Performance.

.3 Refer also to Section 01 29 01 Changes, Payments and Certificates for requirements related to applications for certificates and for applications for payment.

1.4 Project Closeout

.1 Final Cleaning

.1 Refer to CCDC 2 – 2008, GC 3.14 and Section 01 74 01 Cleaning.

.2 Systems Demonstration

.1 Prior to final review, demonstrate operation of each system to Owner. Ten (10) days prior to demonstration, provide an agenda for demonstration and a written description of operating procedure and maintenance, including schematics and diagrams for operation and maintenance of building services equipment and systems being demonstrated.

.2 Responsible personnel from Contractor, Subcontractors and equipment suppliers whose work is being demonstrated shall be present as required at these demonstrations.

.3 Instruct personnel in operation, adjustment, and maintenance of equipment and systems, using provided operation and maintenance data as basis for instruction.

.3 Operating and Maintenance Manuals

.1 Collect reviewed submittals and assemble documents executed by Subcontractors, suppliers, and manufacturers including red-lined as-builts.
.2 Minimum two weeks prior to Substantial Performance of the Work, submit to Consultant, two (2) copies of operating and maintenance manuals. Where Substantial Performance of the Work is not certified, and the Contract proceeds directly to Completion of Contract as defined in applicable lien legislation,

submission shall be minimum two (2) weeks prior to Completion of Contract

.3 Bind contents in a three-ring, hard covered, black plastic jacketed binder, with labelling pocket on spine and with 'D' type rings. Size for 8-1/2" x 11" size paper, enclose title sheet labelled "Operating and Maintenance Data Manual", project name, date and list of contents. Organize contents into applicable sections of work to parallel project specification breakdown. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.

.4 Include following information as applicable, plus data specified elsewhere: operational information on equipment, cleaning and lubrication schedules, filters, overhaul and adjustment schedules and similar maintenance information; copy of building permit; copy of final inspection certificate by Electrical Safety Authority; copy of fire alarm verification certificate; copy of sprinkler test verification certificate; copy of certificates issued by other utilities; copies of field tests; copies of all inspection and testing reports; maintenance instructions for finished surface and materials; copy of hardware and paint schedules; description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list; indicate nameplate information such as make, size, capacity, serial number; names, addresses and phone numbers of Contractor, Subcontractors and Suppliers, including local source of supplies and replacement parts; manufacturer's product guarantees and warranties, executed in the name of the Owner, showing name and address of project and guaranty/warranty commencement date and duration of guaranty/warranty, and clear indication of what is being guaranteed and what remedial action will be taken under guaranty/warranty; additional material used in project listed under various sections showing name of manufacturer and source of supply.

.5 For Mechanical and Electrical include: description of system; controls including diagrams; maintenance and testing schedule; method of operation for each piece of equipment, and list of equipment with replacement parts, parts number, suppliers, addresses, etc. Refer also to Division 15, Division 16 and Division 27 as applicable for particular requirements relevant to respective Division.

.6 Neatly type lists and notes. Use clear drawings, diagrams or manufacturers' literature.

.7 Each set of manuals shall include complete set of reviewed shop drawings and product data sheets, indicating corrections and changes made during fabrication and installation.

.8 Each set of manuals shall include a copy of all of the above information on a CD in a searchable .pdf format.

.4 Maintenance Materials and Spare Parts:

.1 Where supply of maintenance materials and spare parts are specified, deliver to Owner as follows:

.1 Use unbroken cartons, or if not supplied in cartons, they shall be strongly packaged. Supply maintenance materials and spare parts in quantities specified in individual specification sections.

.2 Provide only new materials as maintenance materials and spare parts, of the same manufacture, type and quality as incorporated into the Work.

.3 Store in locations directed, in a manner to prevent damage or deterioration.

.4 Clearly mark containers as to content.

.5 If applicable, give colour, room number, or area where material used.

.6 Obtain receipt from Owner upon delivery of materials.

.5 Project Record Documents

.1 After award of Contract, the Owner will provide an electronic copy of the contract drawings and specifications (or project manual) for purpose of maintaining record drawings and specifications. The Contractor will be responsible for printing three (3) sets of whiteprint (blueline or blackline) contract drawings and specifications. Accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by Consultant and the Owner.

.2 Record locations of: concealed components of mechanical and electrical services; depths of various elements of foundations in relation to first floor, accurate location, depth, size and type of outside underground utilities; location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features or structure; field changes of dimension and detail; changes made by Change Order, Change Directive or Site Instruction.

.3 At completion of project and prior to final review, neatly transfer notations to a second and third set of drawings and specifications. In addition, create an electronic copy of the record drawings and specifications complete with the transferred notations, in the AutoCAD and .pdf format of the original electronic copy. Submit all final copies to Consultant/Owner.

.4 Record changes on prints using a different colour of felt tip pen markers for each major system.

.5 Mark up specifications to record actual construction, including manufacturer, trade name, and catalogue number of each item actually installed, particularly alternative, optional and substitute items.

.6 Identify all copies of the drawings and specifications as "Project Record Copy". Maintain in new condition and make available for review on site by Consultant/Owner.

.7 Minimum 2 weeks prior to application for final payment, submit all copies of the Project Record Documents to Consultant/Owner.

.8 Provide paper and electronic copies of the survey for the foundations and the documentation related to existing utilities and site services as required by Section 01 54 03.

.6 Electronic Documents

.1 Any electronic documentation submitted must be in the formats described above.

.2 Any electronic documentation submitted must be able to be read by our computers or the documentation will be returned for re-submission.

.3 To ensure that the documents are able to be read on a computer different

than yours, please enable the “close the disc upon completion” option in your disc authorizing application.

.7 Financial Close-Out

.1 Execute transition of Performance and Labour and Materials Payment Bond, if any, to warranty period requirements.

.2 Submit a final statement of accounting giving total adjusted Contract Price, previous payments, and monies remaining due.

.3 Consultant will issue a final change order reflecting approved adjustments to Contract Price not previously made.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

**********END**********

1. GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Requirements

.2 Section 01 33 01 Submittals

.3 Section 01 45 01 Quality Control

.4 Section 01 61 01 Material and Equipment

.5 Division 15 – Mechanical

.6 Division 16 – Electrical

.7 Division 17 – Communications

1.2 Definitions

.1 Commissioning Authority – Owner's appointed representative – considered to be the Commissioning Engineer.

.2 Contractor's Commissioning Agent – General Contractor's appointed representative

.3 Consultant Team – consists of those professionals who are responsible for the design and performance objectives and are listed in Section 00 00 03.

.4 Commissioning Team will consist of various participants involved in the commissioning process. The commissioning documentation and tasks of each team member will be coordinated through the Commissioning Authority.

1.3 Consultant Team

.1 The Consultant Team for the Project is responsible for developing a set of performance objectives and providing a design that meets those objectives. The Consultant Team will be required to assist with developing and witnessing the system tests and integrated systems tests. Consultants are to advise the Contractor as to which tests require witnessing.

1.4 Commissioning Team

Members of the team shall include the following as a minimum:

- Owner: University of Guelph

- Owner's Representative: Shane Danis
  University of Guelph
  Tel: 519-824-4120 ext. 56905
  shane@pr.uoguelph.ca

- Owner's Facility Management Representative: Mechanical
  Steven Head
  University of Guelph
  Tel: 519-824-4120 ext. 53308
  steveh@pr.uoguelph.ca

- Owner's Facility Management Representative: Electrical
  Douglas Doel
  University of Guelph
  Tel: 519-824-4120 ext. 53459
  douglas@pr.uoguelph.ca

• Owner's Commissioning Authority: MMM Farid Ahmed
MMM Group Ltd.
Tel: 519-743-8777 ext 2468
ahmedf@mmm.ca

Consultant Team
• Architect: Masri O Inc. Architects, Reema Masri
Tel: 519-579-0072
rmasri@masrio.ca

• Mechanical Consultant: DEI & Associates, Andrew Henderson
Tel: 519-725-3555
ahenderson@deiassociates.ca

• Electrical Consultant: DEI & Associates, Jeremy Jackson
Tel: 519-725-3555
jjackson@deiassociates.ca

Contractors
• General Contractor:
• Mechanical Sub-contractor:
• Electrical Sub-contractor:
• Contractor's Commissioning Agent:
• Testing and Balancing Agent:
• Controls Sub-Contractor:
• Other Sub-Contractors (as applicable):

Other key players in the commissioning process include:

• Manufacturer's Representatives (as applicable):
• Inspectors and Testing Agencies:
Building Inspection City of Guelph
Hydro Guelph Hydro

1.5 Submittals

.1 Submittal Drawings and Equipment Data - to be submitted by Contractor – refer to Section 01 33 01. The Commissioning Authority will review submittals to ensure the systems and equipment being supplied is consistent with the required commissioning test procedures, and if not, that the variances are acceptable to the Team, and that commissioning checklists are revised accordingly.

.2 As-Built Record Drawings – refer to Section 01 77 01. The various trades shall mark-'up the consultants' drawings to clearly indicate the approved changes in the design or layout that took place during construction.

.3 O&M Manuals - refer to Section 01 77 01. The commissioning agent shall compile manuals as specified in the contract documents.

1.6 Manufacturer's Instructions

.1 Unless otherwise indicated in the specifications, operate Products in accordance with manufacturer's instructions. Obtain written instructions directly from manufacturers.

.2 Notify the Consultant in writing, of conflicts between the specifications and manufacturer's instructions, so that the Consultant may establish the course of action.

.3 Improper operation of Products, due to failure in complying with these requirements, authorizes the Consultant to require removal and re-installation at no

change in Contract Price or Contract Time.
Not Used.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 Overview

.1 In general terms, commissioning is the process of assuring and verifying that an installation is functioning fully in accordance with the Owner's requirements, the contract documents and the design intent.

.2 To achieve this, the following is required of the Commissioning Team:

.1 document the owner’s requirements
.2 review the design documents to ensure that the commissioning requirements and responsibilities are clearly defined,
.3 review the Consultants functional testing criteria and procedures, and suggest revisions as necessary to ensure they are consistent with the commissioning requirements,
.4 verify that tests and inspections are carried out properly and successfully.

3.2 Commissioning Team Responsibilities

.1 The cooperation of each member of the design and construction team will be required for the successful completion of this project. In order to provide a fully functional and fully commissioned building, each member must understand their responsibility with regard to commissioning and be willing to fulfill those requirements.

3.3 Commissioning Authority

.1 The Commissioning Authority serves as an objective advocate for the Owner, oversees the commissioning process and presents final recommendations to the Owner regarding the performance of the commissioned building. The following tasks will be performed by Commissioning Authority:

.1 Ensure that the commissioning requirements identified herein are implemented throughout the life of the project.
.2 Identify all relevant features and systems included in the Commissioning scope.
.3 Review the Owner's requirements and basis of design.
.4 Coordinate the commissioning related activities of all members of the Commissioning Team.
.5 Review Contract Documents to ensure appropriate inclusion of commissioning responsibilities for all contractors, trades, and suppliers. Commissioning Authority will include a report on the review of the design development, construction documents and contractor submittals.
.6 Review Contractor's functional testing criteria, including start up plan, check lists, balancing procedures and other related issues; present recommendations for revisions and include approved checklists and testing procedures in the Commissioning Plan.
.7 Organize and chair meetings of the Commissioning Team; issue minutes to all Commissioning Team members.
.8 Monitor construction for commissioning related installation issues.
.9 Verify start up results by observing a sampling of measurements.
.10 Verify the performance of all systems being commissioned by witnessing functional performance tests, and ensuring the results meet test criteria. Commissioning Authority in consultation with the Owner’s Representative to advise the Contractor as to which tests require witnessing.

.11 Verify automatic control systems by:
.1 Observing a sampling of point to point checks
.2 Obtaining and reviewing a copy of installation end-to-end check sheets.
.3 Observing a sampling of actuator travel ranges
.4 Observing a sampling of sensor calibration
.5 Observing a sampling of controls functional response
.6 Reviewing sample trend logs
.7 Verifying documentation of the testing of control sequences under all operating modes.
.12 Verify reported Testing and Balancing results by observing a sampling of measurements.
.13 Review Operating and Maintenance Manuals for compliance with specified content.
.14 Review seasonal testing.
.15 Prepare a commissioning report. The Commissioning Authority will collect and collate all test reports from the commissioning agent and assemble in the report.
.16 Carry out warranty year duties – including a review and Commissioning Look Back Report within 10 months of substantial completion of the Project

3.4 Contractors Commissioning Agent

.1 Contractors are responsible for providing a quality installation and delivering a fully commissioned facility that meets the performance objectives. They are required to assist with the execution of the functional tests and resolve any issues that arise. They are also required to complete check sheets showing compliance with the specifications.

.2 The General Contractor shall identify or engage a Commissioning Agent, to the satisfaction to the Owner, to execute the requirements set out by the Commissioning Authority. The following tasks must be performed by the Contractor's Commissioning Agent:
.1 Prepare all functional testing criteria (including specific documentation) as required by the Commissioning Plan for all features and systems requiring commissioning;
.2 Submit all required testing documentation to the Commissioning Authority and Mechanical Consultant for review;
.3 Attend all commissioning meetings as required by the Commissioning Authority;
.4 Execute or delegate all commissioning tasks as set out in the Commissioning Verification Forms (CVFs);
.5 Participate in troubleshooting those systems that do not meet the functional testing criteria and provide all necessary follow-up testing and documentation;
.6 Submit completed CVFs and functional test documentation to the Commissioning Authority for inclusion into the final Commissioning Report;
.7 Engage a balancing agent to test and adjust flows and verify operating parameters, etc as specified in the contract documents; and
.8 Plan and execute all Building Operator training as set out in the Commissioning Plan.

3.5 Commissioning Verification Forms (CVF)

.1 CVFs contain Pre-start/Start-up, Start-up, and Functional Performance Test checklist and documentation requirements. It is the responsibility of the Contractor's commissioning agent to ensure all CVF's are completed and submitted to the Commissioning Authority for review prior to testing (i.e., at the shop drawing submittal stage). Contractor and/or vendor checklists may be used in lieu of CVF's, as long as the coverage is maintained. The engineering consultants are to indicate in advance which tests require witnessing.

.2 Items in the CVFs include:

.1 Pre-start/Start-up Checklists - document, in checklist format, each item by all involved trades, which must be completed prior to start-up of the specific system or piece of equipment. Competent contractors know these pre-requisites. But having information for all trades written down, and in one document, facilitates the coordination of all the various activities that are required. It also formally confirms either that the work has been completed correctly or that it requires either completion or correction.

.2 Start-up Checklists - document, in checklist format, each item by all involved trades, in relation to start-up and testing of specific pieces of equipment. They provide space to record the various operational items that require checking in order to confirm correct operation or to identify problems needing correction. Controls shall be tested, verified and documented by the Contractor including start-up, shut down, unoccupied and manual modes, modulation up and down over unit's range of, capacity, component staging, power failure and backup/restart, interlocks, alarms, and sensor calibration. Start-up and testing must be clearly documented according to the respective manufacturer's written instructions and the Contract Documents. Once the Commissioning Authority confirms a successful start-up, the Contractor can then proceed to functional testing.

.3 Functional Performance Test Checklists - contain the step-by-step procedure by which each and every functional requirement of a system, and its various components will be tested and the system's response verified. They will comprise all specified requirements including start-up, increasing load, decreasing load, modulation up and down over unit's range of capacity, shutdown, operation under all climatic conditions, including all normal modes of operation, and also under potential abnormal and emergency conditions including power failure and backup/restart. The goal is to ensure the installation functions properly under all specified conditions, not that it can be shown to function under at least one condition.

.3 Testing and Balancing Report - The balancing agent shall test and adjust flows, operating parameters, etc. as specified in the contract documents. A balancing report shall be provided.

3.6 List of Items Requiring Commissioning

.1 The following systems will be commissioned:

.1 Architectural Systems

1. Doors and Windows
   a. Hardware
   b. Operators and Operation
2. Entrances and Storefronts
   a. Operators and Operation
3. Information Specialties – including visual display surfaces (boards, screens)
   a. Operators and Operation
4. Interior Specialties – including movable partitions and components, toilet and bath accessories, storage units
   a. Operators and Operation
5. Equipment – including any food service, food storage, cooler, freezer, healthcare, materials handling, disposal, parking
   a. Operators and Operation
6. Furnishings – including blinds and drapes
   a. Operators and Operation

. 2 Mechanical Systems

1. Fire Protection Systems
   a. Fire Dampers

b. Fire Extinguisher Cabinets
c. Automatic Sprinkler System
d. Backflow Preventer

2. Ventilation Systems
   a. Fans
   b. Motor Operated Dampers
   c. Roof Hoods
   d. Variable Air Volume Boxes
   e. Grilles, Registers, and Diffusers
3. Domestic Water System
   a. Piping
   b. Mixing Valve for DHWH
   c. Backflow Preventer
4. Heating System
   a. Piping
   b. Control Valves
   c. Thermostats
   d. Controls
   e. Chemical Treatment
5. Hydronic System
   a. Piping
   b. Control Valves
6. Plumbing System
   a. Floor Drains
   b. Cleanouts
   c. Plumbing Fixtures
   d. Fixture Carriers
   e. Dual Flush Valves
   f. Pipe Filters
   g. Primed Traps
   h. Backflow Preventer
7. Packaged Units
   a. Radiant Unit Heaters
   b. Horizontal Unit Heaters
8. Testing, Adjusting and Balancing Work

.3 Integrated Automation
1. Central Building Automation System,
   a. Controllers
   b. Field Devices
   c. Sequences
   d. Network
   e. Operator Interface

.4 Electrical Systems
1. Lighting
   a. Light Fixtures
   b. Emergency/Normal Power
   c. Addressable Ballasts'
   d. Occupancy Sensors
   e. Lighting Control System
   f. Sequences
   g. Schedules

2. Normal Power Distribution System
   a. Electrical Switchboards and Panelboards
   b. Ladder Type Cable Tray
   c. Wire Basket Type Cable Tray

d. Cables
e. Low Voltage Control Equipment

3. Fire Alarm System
a. Devices – set up in a listing
b. Fire Panels
c. Network

3.7 Training

.1 It is the responsibility of the Contractor (Commissioning Agent) to ensure that the Owner's Facility Operator/Management Staff has all the information and training needed to operate and maintain the commissioned features and systems. The Facility Management staff shall be trained by the Contractor. The training process shall include the following:

.1 All commissioned features and systems shall be covered.
.2 Sufficient training performed by qualified individuals for sufficient duration to ensure operator understanding.
.3 Description of the general purpose of systems (Design Intent).
.4 Use of O&M manuals.
.5 Review of control drawings, schematics and programmed sequences.
.6 Start-up, normal operation, shut down, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting and alarms.
.7 Interactions with other systems.
.8 Adjustments and optimizing method for energy conservation.
.9 Relevant health and safety issues such as operating procedures and MSDS records.
.10 Special maintenance and replacement sources.
.11 Tenant interaction issues.
.12 Discussion of how the features and systems are environmentally responsive.

.2 The Contractor is expected to prepare a schedule for all training in consultation with the Owner's Representative so that all personnel that should be trained are included in the appropriate training.

3.8 Commissioning Schedule

.1 Commissioning activities will be integrated into the overall project schedule with sufficient detail to coordinate trades to ensure each system's completion prior to its scheduled start-up date and to highlight tests and inspections. This commissioning activity schedule will be managed through ongoing communication, monthly commissioning meetings and through specific commissioning coordination sessions, as necessary.

.2 Commissioning Schedule highlighting the overall commissioning process will be provided at Commissioning kick off meeting.

.3 Below is a list of overall commissioning process items:

.1 Assemble Commissioning Team
.2 Review Design Intent

.3 Conduct focused review of design
.4 Update Commissioning Plan
.5 List all features, equipment and systems to be commissioned in tender documents
.6 Complete commissioning sections of documents
.7 Detailed review of Architectural, Structural, Mechanical, Electrical tender documents
.8 Commissioning Authority to ensure that commissioning requirements and responsibilities are clearly described in the contract (Architectural, Structural, Mechanical, and Electrical tender documents)
.9 Commissioning Team and contractors and trades meeting to review the commissioning requirements and processes relating to their disciplines
.10 Shop drawings submitted and reviewed
.11 Commissioning Team to meet for review of Contractors' functional testing criteria, including start up plan, check lists, balancing procedures. Revise as necessary
.12 Contractors to submit updated checklists and testing procedures for approval and inclusion in the Commissioning Plan
.13 Installation: ensure systems and features are installed properly Testing and verification of functional performance by the Commissioning Team
.14 Commissioning and TAB reports, O&M manuals submitted for review Develop a re-commissioning management manual
.15 Review seasonal testing (as appropriate)
.16 Produce Commissioning Report
.17 One-year Commissioning Look Back Report

3.9 Commissioning Meetings

.1 Commissioning Team members will be required to attend commissioning meetings and specific commissioning coordination sessions, as necessary. It is envisioned that initial meetings will be monthly, increasing to bi-weekly as testing accelerates.

.2 The meetings will extend into the handover period, merging with construction deficiency meetings. Required attendees at the meeting will vary as the project progresses.

.3 The Commissioning Authority is responsible, for ensuring the appropriate parties are either in attendance or that he/she can answer all questions relating to that party's work.

**********END**********

1 General

1.1 REFERENCES

.1 CSA S350-M1980 (R2003): Code of Practice for Safety in Demolition of Structures.

.2 CSA Z783-12: Deconstruction of Buildings and Their Related Parts.

1.2 SEQUENCING

.1 Coordinate demolition activities with Phasing Schedule indicated on the Drawings.

.2 Schedule demolition activities to minimize disruption to existing building operations.

.3 Verify demolition schedule with Consultant prior to commencement of the Work.

.4 Protect occupants from dust and from any danger arising from the work of this Section. Refer to Division 01.

1.3 SPECIAL PROCEDURE SUBMITTALS

.1 Submit digital copy of each photograph taken of existing conditions to Consultant.

.2 Refer to structural Drawings for partial vault demolition requirements.

1.4 QUALIFICATIONS

.1 Demolition Supervisor: an individual experienced in the deconstruction of buildings to ensure that demolition is carried out safely, expeditiously and without unnecessary damage to materials and surfaces that are designated to remain.

1.5 FIELD CONDITIONS

.1 Inspect and photograph existing adjacent surfaces and assemblies.

.2 Record conditions and stability in a manner suitable for evaluation of possible damage caused by demolition operations.

.3 Approximate locations of existing building services may be indicated on Drawings. The Consultant assumes no responsibility for the accuracy of this information.

2 Products

2.1 REGULATORY REQUIREMENTS

.1 Permits and Fees: include tipping charges and other related fees necessary for the completion of the demolition operations.

.2 Utilities: Obtain approval from the appropriate authorities prior to commencing demolition operations.

.3 Hazardous Waste: Conform to requirements of authorities having jurisdiction.

2.2 EQUIPMENT

.1 Demolition: appropriate equipment for the phase of work contemplated.

.2 Do not use heavy equipment for making openings in existing walls or in confined spaces where damage to other work may result.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify locations and construction of structures to be demolished.

.3 Verify construction and details of other existing and adjacent property.

.4 Verify location of utility and other services.

.5 Electronically scan concrete for presence of facility services and reinforcing prior to commencing demolition. Do not use X-Ray equipment to conduct concrete scans.

3.2 PREPARATION

.1 Erect shoring, bracing and other temporary structures to prevent collapse, settlement and movement of property. Refer to Division 01.

.2 Provide and maintain dust protection screen as specified in Division 01.

.3 Barricade access by unauthorized persons to areas in which demolition is in-progress.

.4 Post danger signs in conspicuous locations to warn persons that demolition is in-progress.

.5 Erect protection to ensure safe access that must be maintained to existing areas still occupied by the public.

.6 Protect adjacent property from damage caused by demolition operations.

.7 Remove flammable and contaminated materials, and refuse from area before demolition operations commence.

.8 Arrange for the disconnection, capping and plugging of any facility services that may be affected by demolition operations.

.9 Temporarily re-route facility service lines entering building, or on the building in accordance with authorities having jurisdiction, and to suit the Work of this Contract.

.10 Post warning signs on electrical lines and equipment that must remain energized during the period of the Work.

3.3 DEMOLITION

.1 Perform demolition work in an expeditious and safe manner.

.2 Conform to CSA S350-M and CSA Z783.

.3 Confine demolition operations to only the areas required.

.4 Prevent and contain the spread of dust.

.5 Do not drop debris more than one storey unless in an enclosed chute. Lower large components carefully, under control and fully supported at all times.

.6 Withdraw or flatten protruding nails as demolition operations proceed.

.7 At the end of each Working Day, ensure the Work is left in a safe condition, with no danger of collapse.

3.4 SALVAGE

.1 Carefully remove materials scheduled for salvage to CSA Z783. Protect from damage.

.2 Store salvaged materials in secure locations, protected from damage.

.3 Items not scheduled for salvage become the property of the Contractor.

3.5 CLEANING

.1 Leave the Place of the Work in a clean and orderly condition, ready for use by others.

.2 Remove debris as specified in Division 01.

.3 Remove protections, barricades and other temporary constructions on completion of demolition operations.

.4 Make Good property and materials damaged during demolition operations.

3.6 ITEMS SCHEDULED FOR SALVAGE

.1 Suspended acoustic tile ceilings complete with mechanical and electrical items in ceiling.

.2 Other mechanical and electrical items which impede the installation of new elements.

.3 All other elements required to allow the Work to be completed, whether specifically indicated or not.

END OF SECTION

1 General

1.1 REFERENCES

.1 ASTM E84-16: Standard Test Method for Surface Burning Characteristics of Building Materials.

.2 ASTM F1869-16: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

.3 ASTM F2873-13: Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring.

1.2 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: provide physical characteristics, product limitations and maintenance instructions.

1.3 MANUFACTURER'S INSTRUCTIONS

.1 Submit manufacturer's instructions as specified in Division 01.

.2 Manufacturer's Instructions: standard installation guidelines and instructions, indicating mixing and curing instructions.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products in their original unopened packages and protected from exposure to the elements.

.3 Remove damaged or deteriorated Products immediately from the Place of the Work.

1.5 AMBIENT CONDITIONS

.1 Maintain ambient air temperature at minimum 10 degrees Celsius; for 24 hours before, during and 72 hours after installation of underlayment.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Mapei.

.2 Substitution Procedures: refer to Section 01 25 00.

2.2 DESCRIPTION

.1 Cementitious Underlayment: plant-batched, high compressive strength, polymer-modified cementitious self- levelling floor underlayment, suitable for commercial and light industrial uses.

2.3 REGULATORY REQUIREMENTS

.1 Regulatory Requirements: conform to applicable codes for combustibility or flame spread requirements.

2.4 PERFORMANCE CRITERA

.1 Cementitious Underlayment: meeting the following tested criteria at 28 days:
.1 Compressive Strength (ASTM C109): >34.5 MPa.
.2 Flexural Strength (ASTM C348): >8.8 MPa.
.3 Pullout Strength: >3 MPa.

2.5 MATERIALS

.1 Cementitious Underlayment: polymer-modified cement-based mix, pumpable grade; plant-batched; Grey colour; Ultraplan M20 Plus by Mapei.

.2 Primer: solvent-free, single-component primer.

.3 Joint and Crack Filler: latex based.

.4 Water: clean, potable.

2.6 MIXING

.1 Mix Products to consistency necessary to achieve self-levelling properties.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

.3 Concrete Slabs-on-Fill: Conduct moisture vapour emission rate (MVER) tests to ASTM F1869. Do not proceed with installation until tests indicate maximum 2.27 kg per 100 sm for a 24 hour period.

3.2 PREPARATION

.1 Prepare substrate to receive application in accordance with manufacturer's instructions.

.2 Remove loose materials, dirt, deleterious materials, grease, oil, etc. using wire brush or other suitable methods.

.3 Prime substrate and allow to dry.

3.3 INSTALLATION

.1 Install Products to ASTM F2873.

.2 Place to thickness indicated.

.3 Air cure underlayment.

3.4 PROTECTION

.1 Refer to Division 01.

.2 Protect completed installation until application of finish flooring Products.

.3 Cover with suitable solid protective covering, such as plywood or masonite sheets.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 05 50 00 - Metal Fabrications.

.2 Section 07 84 00 - Firestopping.

.3 Section 07 92 00 - Joint Sealants.

.4 Section 08 12 13 - Hollow Metal Frames.

.5 Section 08 90 00 - Louvers and Vents.

.6 Section 09 90 00 - Painting and Coating.

1.2 REFERENCES

.1 ASTM A641/A641M-09a(2014): Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

.2 ASTM C331/C331M-14: Standard Specification for Lightweight Aggregates for Concrete Masonry Units.

.3 CSA A165 SERIES-14: CSA Standards on Concrete Masonry Units.

.4 CSA A179-14: Mortar and Grout for Unit Masonry.

.5 CSA A370-14: Connectors for Masonry.

.6 CSA A371-14: Masonry Construction for Buildings.

.7 CSA A3001-13: Cementitious Materials for Use in Concrete.

.8 CSA A3002-13: Masonry and Mortar Cement.

.9 CSA G30.18-09: Carbon Steel Bars for Concrete Reinforcement.

.10 CSA S304-14: Design of Masonry Structures.

.11 CAN/CGSB-1.40-M89: Primer, Structural Steel, Oil Alkyd Type.

.12 NCMA TEK 3-2A-2005: Grouting Concrete Masonry Walls.

.13 NCMA TEK 10-2C-2010: Control Joints for Concrete Masonry Walls - Empirical Method.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver mortar and grout materials in original unbroken and undamaged packages with the maker's name and brand distinctly marked.

.3 Store mortar and grout materials indoors until ready for use.

.4 Store or pile sand on a plank platform and protect from dirt and rubbish.

.5 Store mortar materials and sand in such a manner as to prevent deterioration or contamination by foreign materials.

.6 Deliver masonry units in an approved protective film.

.7 Store masonry units off the ground with care to avoid damage. Damaged units will not be acceptable for face work.

1.4 AMBIENT CONDITIONS

.1 Environmental Requirements: to CSA A371.

.2 Do not use anti-freeze, liquid salts, or other substances to lower the freezing point of mortar or grout.

1.5 EXISTING CONDITIONS

.1 Existing conditions at the Place of the Work may require adjustment to counteract variations resulting from inaccuracies in previous construction.

.2 The restricted availability of imperial-sized products may also require that adjustments be made.

.3 Make necessary adjustments to ensure the proper fit and coursing of masonry.

2 Products

2.1 MORTAR MATERIALS

.1 Portland Cement: to CSA A3001, Type GU; Grey colour.

.2 Masonry Cement: to CSA A3002, Type N.

.3 Mortar Aggregate: to CSA A179, standard masonry type; clean, dry, protected against dampness, freezing, and foreign matter.

.4 Grout Coarse Aggregate: to CSA A179, maximum 10 mm size; 27 percent by volume.

.5 Grout Fine Aggregate: to CSA A179, clean well graded sharp sand; 54 percent by volume.

.6 Water: potable, clean and free of deleterious amounts of acids, alkalies or organic materials.

.7 Plasticizer: water reducing type, reducing porosity and absorption to increase bond strength.

2.2 MASONRY UNITS

.1 Concrete Masonry Unit - Lightweight (CMU-LWT): to CSA A165.1, H/15/C/M; using $L_2$20S slag aggregate to ASTM C331; sizes as indicated on Drawings.

2.3 REINFORCEMENT AND ANCHORAGES

.1 Horizontal Joint Reinforcement: as specified on structural Drawings.

.2 Reinforcing Steel: new billet steel, deformed bars, to CSA G30.18, Grade 400R; sizes as indicated on Drawings.

2.4 MASONRY ACCESSORIES

.1 Building Paper: No. 15 asphalt saturated felt.

.2 Joint Sealant: as specified in Section 07 92 00.

2.5 MORTAR MIXES

.1 Mortar for Use with Loadbearing Concrete Unit Masonry: Portland cement-Masonry cement-Sand mix, to CSA A179, Type S using the Property specification method; minimum compressive strength 8.5 MPa at 28 days.

.2 Mortar for Use with Non-Loadbearing Concrete Unit Masonry: Masonry cement-Sand mix, to CSA A179, Type N using the Property specification method; minimum compressive strength 3.5 MPa at 28 days.

2.6 MORTAR MIXING

.1 Thoroughly mix ingredients in proper quantities needed for immediate use to CSA A179.

.2 Provide mortar of uniform mix and colour.

.3 Take representative samples for testing consistency of strength and colour to CSA A179.

.4 Use mortar within 2 hours after mixing at temperatures of 26 degrees Celsius, or 2-1/2 hours at temperatures under 10 degrees Celsius.

2.7 GROUT MIXES

.1 Grout for Use in Spaces 50 mm or Wider: Portland cement-Hydrated lime-Sand-Coarse Aggregate mix, to CSA A179, Coarse Grout using the Property Specification method.

.2 Grout for Use in Spaces Narrower than 50 mm: Portland cement-Hydrated lime-Sand mix, to CSA A179, Fine Grout using the Property Specification method.

.3 Match grout's 28 day compressive strength to the compressive strength of the concrete masonry unit being filled.

2.8 GROUT MIXING

.1 Thoroughly mix ingredients accurately in measured quantities needed for immediate use, to CSA A179.

2.9 FINISHES

.1 Mill Galvanized Coating on Steel Components: to ASTM A641/A641M, Regular; minimum 30 g/m^2 zinc coating on all surfaces.

3 Execution

3.1 COORDINATION WITH OTHERS

.1 Securely install frames, louvres, sleeves, chases, reglets, equipment, etc. supplied by others.

.2 Anchor frames with the backs of jambs solidly packed with mortar. Where mortar additives have been used to prevent freezing, coat metal frames with bitumen paint before installation.

.3 Provide openings wherever required, including those required by mechanical and electrical Subcontractors. Locating openings is the responsibility of the component installer.

.4 Accurately locate chases and openings and neatly finish to the required sizes.

.5 No pipe, conduit chases or enclosures shall be covered until advised that the work has been inspected and tested.

.6 Co-ordinate placement of steel and concrete anchors with each trade as applicable.

3.2 COURSING

.1 Place masonry to lines and levels indicated.

.2 Maintain masonry courses to uniform width.

.3 Lay masonry units in half-running bond.

.4 Maintain 10 mm thick mortar joints in both directions.

.5 Tool mortar joints when thumbprint hard to a smooth, tightly compressed, concave surface.

3.3 PLACING AND BONDING

.1 Lay masonry in full bed of mortar, properly jointed with other work. Buttering corners of joints, and deep or excessive furrowing of mortar joints are not permitted.

.2 Fully bond intersections, and external corners.

.3 Strike mortar joints flush where resilient base is scheduled.

.4 Isolate masonry partitions from vertical structural framing members with a control joint.

.5 Extend and anchor non-loadbearing partitions to underside of structural deck.

.6 Use Bull Nose concrete blocks at exposed corners.

3.4 REINFORCEMENT AND ANCHORAGES

.1 Conform to CSA A370.

.2 Place masonry joint reinforcement continuous in every second horizontal joint.

.3 Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend 400 mm minimum each side of opening.

.4 Place joint reinforcement continuous in first and second joint below top of walls.

.5 Install reinforcing bars supported and secured against displacement.

.6 Provide prefabricated corner and tee-shaped horizontal joint reinforcing at corners and intersections of walls.

3.5 LINTELS

.1 Install loose steel lintels as scheduled.

.2 Set steel lintels dry to permit movement.

3.6 GROUTED COMPONENTS

.1 Install masonry grout to NCMA TEK 3-2A.

3.7 MOVEMENT AND CONTROL JOINTS

.1 Provide control joints in concrete unit masonry to NCMA TEK 10-2C.

.2 Do not continue horizontal joint reinforcing across control joints.

.3 Size joints as specified in Section 07 92 00 for sealant performance.

3.8 TOLERANCES

.1 Variation from Unit to Adjacent Unit: maximum 1.5 mm.

.2 Variation of Joint Thickness: maximum 3 mm per metre.

3.9 CLEANING

.1 Clean masonry as installation progresses.

.2 Allow mortar droppings on masonry to partially dry, then remove by brushing with a stiff fibre brush.

3.10 FIELD QUALITY CONTROL

.1 Perform field inspection and testing as specified in Division 01.

.2 Submit sample cubes of mortar and grout to CSA S304 for laboratory testing.

.3 Report on the compressive strength and water content of mortar and grout mixes.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 07 84 00 - Firestopping.

.3 Section 09 90 00 - Painting and Coating.

.4 Section 10 21 13.19 - Plastic Toilet Compartments.

1.2 REFERENCES

.1 AAMA 611-12: Voluntary Specification for Anodized Architectural Aluminum.

.2 AAMA 2603-02: Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.3 ASTM A123/A123M-15: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.4 ASTM A153/A153M-16: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.5 ASTM A240/A240M-16: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.6 ASTM A269/A269M-15a: Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.7 ASTM A307-14: Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

.8 ASTM A449-14: Standard Specification for Hex Cap Screws, Bolts, and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.

.9 ASTM A563M-07(2013): Standard Specification for Carbon and Alloy Steel Nuts (Metric).

.10 ASTM A653/A653M-15e1: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.11 ASTM B209M-14: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).

.12 ASTM B221M-13: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

.13 ASTM F436M-11: Standard Specification for Hardened Steel Washers.

.14 ASTM F467M-06a(2012): Standard Specification for Nonferrous Nuts for General Use (Metric).

.15 ASTM F468M-06(2012): Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use (Metric).

.16 ASTM F593-13ae1: Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.

.17 ASTM F594-09(2015): Standard Specification for Stainless Steel Nuts.

.18 ASTM F3125-15a: Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

.19 CGSB 85-GP-10M: Shop Painting Structural Steel.

.20 CGSB 85-GP-16M: Painting Galvanized Steel.

.21 CSA A500-16: Building Guards.

.22 CSA G40.20-13: General Requirements for Rolled or Welded Structural Quality Steel.

.23 CSA G40.21-13: Structural Quality Steels.

.24 CAN/CSA-S136-12: North American Specification for the Design of Cold-Formed Steel Structural Members.

.25 CSA W47.1-09 (R2014): Certification of Companies for Fusion Welding of Steel.

.26 CSA W55.3-08 (R2013): Certification of Companies for Resistance Welding of Steel and Aluminum.

.27 CSA W59-13: Welded Steel Construction (Metal Arc Welding).

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.

.3 Shop Drawings for metal guards, balustrades, railings and handrails must be stamped, signed and dated by the fabricator's design engineer.

1.4 QUALIFICATIONS

.1 Fabricator's Design Engineer: a professional structural engineer, experienced in design of steel balustrades, guards and railings, and licensed in the Place of the Work.

.2 Fabricator: company specializing in welded components with three years documented experience.

.3 Welders: certified by the Canadian Welding Bureau to CSA W47.1 and CSA W55.3.

2 Products

2.1 DESIGN CRITERIA

.1 Design metal guards, including balustrades, railings and handrails, to CSA A500; resisting a uniform load of 0.75 kN/m and a lateral force of 1.0 kN at any point without damage or permanent set.

2.2 MATERIALS

.1 Steel Sheet: to ASTM A653/A653M, Grade 230, hot dipped galvanized, thicknesses as indicated.

.2 Steel Sections and Plates: to CSA G40.20 and CSA G40.21, Grade 300W; profiles and sizes as indicated.

.3 Hollow Structural Steel Sections: to CSA G40.20 and CSA G40.21, Grade 350W, Class H; sizes as indicated.

.4 Stainless Steel Sheet, Sections and Plates: to ASTM A240/A240M, Type 304; profiles and sizes as indicated.

.5 Stainless Steel Tubing: to ASTM A269/A269M, Grade TP316; profiles and sizes as indicated.

.6 Extruded Aluminum: to ASTM B221M, 6063 alloy, T6 temper; profiles and sizes as indicated.

2.3 COMPONENTS

.1 Checkerplate: 6 mm thick sheet steel, to CSA G40.20; 1.27 mm raised checker pattern.

.2 Welded Metal Grating: 4.8 mm twisted steel cross bars welded at 102 mm OC to flat steel bearing bars spaced at 30 mm OC; width and length as indicated on Drawings; galvanized after welding (GAW) finish; eg. Type W/B by Borden Metal Products (Canada) Ltd.

2.4 ACCESSORIES

.1 Stainless Steel Bolts: to ASTM F593, Group 1.

.2 Stainless Steel Nuts and Washers: to ASTM F594, Group 1.

.3 High-Strength Bolts: quenched and tempered steel heavy hex structural bolts, to ASTM F3125, Type 1.

.4 Medium-Strength Bolts: quenched and tempered steel hex bolts, to ASTM A449, Type 1.

.5 Machine Bolts: carbon and alloy steel, to ASTM A307, Grade A; hot dipped galvanized where noted.

.6 Steel Nuts: carbon and alloy steel, to ASTM A563M, Grade A, Heavy Hex Style for use with high strength bolts, and Hex Style for use with medium strength bolts and machine bolts; hot dipped galvanized where noted.

.7 Steel Washers: hardened steel washers, to ASTM F436M, Type 1; circular, beveled and clipped types as required.

.8 Aluminum Bolts: to ASTM F468M, shop finished to match adjacent surfaces.

.9 Aluminum Nuts and Washers: to ASTM F467M, including plain washers; shop finished to match adjacent surfaces.

.10 Welding Materials: to CSA W59.

2.5 PRIMERS

.1 Metal Primer: to CGSB 85-GP-10M, red oxide type.

.2 Galvanized Metal Primer: zinc rich type, to CGSB 85-GP-16M.

2.6 FABRICATION

.1 Prior to fabrication, verify existing conditions and take field measurements to ensure perfect fit of fabricated items.

.2 Fabricate cold-formed steel fabrications to CAN/CSA-S136.

.3 Fabricate metal guards, including balustrades, railings and handrails, to CSA A500.

.4 Fit and shop assemble components in largest practical sections to accommodate delivery to the Place of the Work.

.5 Continuously seal joined pieces by continuous welds.

.6 Grind exposed joints flush and smooth with adjacent finish surface.

.7 Make exposed joints butt tight, flush and hairline.

.8 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; except where specifically noted otherwise.

.9 Supply components required for anchorage of fabrications.

2.7 FINISHES

.1 Shop Priming: Clean surfaces of rust, scale, grease, and foreign matter prior to finishing. Do not prime surfaces in direct contact with concrete or where field welding is required. Prime paint items with two coats.

.2 Galvanized Coating on Sheet Steel: hot dipped, zinc alloy coating, to ASTM A653/A653M, Z275 coating designation.

.3 Galvanized Coating on Steel Components: hot dipped, zinc alloy coating, to ASTM A123/A123M, Z275 coating designation.

.4 Galvanized Coating on Steel Hardware: hot dipped, zinc alloy coating, to ASTM A153/A153M, Class B2.

.5 Stainless Steel: to ASTM A240/A240M and ASTM A269/A269M, No. 4 - Brushed.

.6 Anodized Coating on Aluminum: to AAMA 611, AA-M12C22A31, Class II Clear Anodic Oxide treatment, No. 17.

.7 Liquid-Applied Coating on Aluminum: to AAMA 2603, one-coat acrylic resin liquid extrusion and coil coating, applied to minimum 0.02 mm dry film thickness; eg. Duracron by PPG Industries, Inc.; colour as selected by Consultant.

.8 Powder Coating on Metal Components: electrostatic spray-applied polymer powder coating, minimum 0.05 mm dry film thickness; colour as selected by Consultant.

.9 Shop-Painted Coating on Sheet Steel: two-coat silicone modified polyester coil coating, applied to 0.028 mm total dry film thickness; eg. WeatherXL by Valspar, colour as selected by Consultant.

3 Execution

3.1 PREPARATION

.1 Make provision for erection loads with temporary bracing.

.2 Clean and strip primed steel items to bare metal where site welding is required.

.3 Supply items required to be cast into concrete and or embedded in masonry with setting templates, to appropriate Sections.

3.2 INSTALLATION

.1 Install components plumb and level, accurately fitted, free from distortion or defects.

.2 Provide fasteners and anchors necessary to secure components rigidly in place.

.3 Field weld components to CSA W59.

.4 Field bolt and weld to match shop bolting and welding.

.5 Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.

.6 After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.3 SCHEDULE

.1 The following schedule is a list of principal items only. Refer to Drawings for items not specifically scheduled.
- .1 Countertop Brackets in Wet Areas: stainless steel plate, sizes and configurations as indicated, pre-drilled for fastening of other components.
- .2 Lateral Support Brackets for Masonry Partitions: 75 x 75 mm steel angles, 6 mm thick, as follows:
  - .1 Concealed Conditions: 200 mm long and spaced at 3,000 mm OC; minimum 2 anchors each.
  - .2 Exposed Conditions: continuous lengths, anchored at 1,000 mm OC.
- .3 Metal Sleeves: including templates and required information, supplied to appropriate Sections.
- .4 Attachment Devices: anchor bolts, washers, nuts, lag screws, expansion shields, toggles, straps, sleeves, brackets, etc. as required and secured with sufficient self-tapping shake-proof screws with flat countersunk heads.
- .5 Miscellaneous Brackets: hot dipped galvanized steel plate, sizes and configurations as required to support shelving, seats, benches, valances, coat hooks, etc.; pre-drilled for fastening of other components.
- .6 Metal Corner Guards: bent stainless steel plate, as detailed on Drawings.
- .7 Metal Guards, Balustrades, and Railings: sizes and configurations as indicated on Drawings; engineered by fabricator to meet the specified design criteria; material as noted on Drawings.
- .8 Foot Rests: as detailed on Drawings.
- .9 Toilet Compartment Bracing: shop primed galvanized steel supports for ceiling-suspended toilet compartment, as detailed on Drawings.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 16 43 - Gypsum Sheathing.

.2 Section 06 20 00 - Finish Carpentry.

.3 Section 06 40 00 - Architectural Woodwork.

1.2 REFERENCES

.1 ASTM F1667-15: Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.2 CSA B111-1974 (R2003): Wire Nails, Spikes and Staples.

.3 CSA O141-05 (R2009): Softwood Lumber.

.4 CSA O151-09: Canadian Softwood Plywood.

.5 National Lumber Grades Authority (NLGA): Standard Grading Rules for Canadian Lumber.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver and store Products under waterproof cover.

.3 Prevent damage to Products, existing properties and to the Work.

.4 Store Products where it does not hinder the progress of the Work.

1.4 EXISTING CONDITIONS

.1 The Work involves renovations and alterations to an existing building.

.2 Include any re-blocking or re-framing required.

.3 Make minor adjustments from the Drawings wherever existing conditions dictate.

2 Products

2.1 MATERIALS

.1 Lumber: SPF species, to CSA O141, S4S, S-Dry; NLGA Light Framing classification, Standard and Better Common Grade Mix; sizes as indicated on Drawings.

.2 Plywood: CSP to CSA O151, SHG Grade; veneer core, butt edge, unsanded faces; thicknesses as indicated on Drawings.

.3 Nails: galvanized steel to CSA B111, common wire type for general use and spiral type for structural connections; sizes to suit application.

.4 Driven Fasteners: galvanized steel nails, spikes and staples, to ASTM F1667; sizes to suit application.

.5 Screws: galvanized steel, bugle head, power driven type, sizes to suit application.

.6 Anchors: toggle bolt type for anchorage to hollow masonry, expansion shield and lag bolt type for anchorage to solid masonry or concrete, or bolts or ballistic fasteners for anchorages to steel.

3 Execution

3.1 INSTALLATION

.1 Erect wood framing straight, level and plumb.

.2 Place horizontal members laid flat, crown side up.

.3 Construct items full length without splices.

.4 Secure plywood sheets perpendicular to supports, with ends staggered.

.5 Secure plywood sheet edges over firm bearing.

.6 Provide wood blocking required for attachment of fitments and equipment by other Sections.

.7 Provide 19 mm thick plywood backer board on wood blocking for mounting electrical equipment where indicated on Drawings.

END OF SECTION

1 General

1.1 REFERENCES

.1 ASTM C475/C475M-15: Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.2 ASTM C954-11: 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.

.3 ASTM C1002-14: 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.

.4 ASTM C1177/C1177M-13: Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.5 ASTM C1264-14a: Standard Specification for Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling, and Storage of Gypsum Panel Products.

.6 ASTM C1280-13a: Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.

.7 CGC Inc.: CGC Gypsum Construction Handbook.

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

.9 Gypsum Association GA-214-10: Recommended Levels of Gypsum Board Finish.

1.2 QUALIFICATIONS

.1 Applicators: a firm specializing in the application of gypsum sheathing boards, and having a minimum of 5 years documented experience.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Conform to ASTM C1264.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 G-P Gypsum Corporation.

.2 Substitution Procedures: refer to Section 01 25 00.

2.2 MATERIALS

.1 Gypsum Sheathing Board: 15.9 mm thick; square edges; to ASTM C1177/C1177M, Type X; silicone treated gypsum core, glass fiber mesh facers both sides; DensGlass Fireguard Sheathing by G-P Gypsum Corporation.

.2 Steel Drill Screws: galvanized steel, sheet metal type, to ASTM C954.

.3 Self-Tapping Screws: fine thread, galvanized steel, to ASTM C1002, Type S.

.4 Adhesive: to CAN/CGSB-71.25-M.

.5 Joint Materials: to ASTM C475/C475M; reinforcing tape, joint compound, adhesive, water, fasteners.

.6 Joint Sealant: as specified in Section 07 92 00.

3 Execution

3.1 INSTALLATION

.1 Install Products to ASTM C1280.

.2 Install boards perpendicular to supports with ends staggered.

.3 Secure board edges over firm bearing.

.4 Screw fasten boards to furring or framing.

.5 Provide a Level 1 finish to GA-214.

.6 Finished work shall be plane and free from depressions.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 06 24 00 - High Pressure Decorative Laminate.

.3 Section 06 40 00 - Architectural Woodwork.

.4 Section 06 61 16 - Solid Surfacing Fabrications.

.5 Section 07 92 00 - Joint Sealants.

.6 Section 08 14 00 - Wood Doors.

.7 Section 08 71 00 - Door Hardware.

.8 Section 09 90 00 - Painting and Coating.

1.2 REFERENCES

.1 ANSI A135.4-2004: Basic Hardboard.

.2 ANSI/HPVA HP-1-2009: American National Standard for Hardwood and Decorative Plywood.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC): Architectural Woodwork Standards, Edition 2-2014.

.4 ASTM B456-11e1: Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.5 ASTM F1667-15: Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.6 Canadian Hardwood Plywood and Veneer Association (CHPVA): Official Grading Rules for Canadian Hardwood Plywood.

.7 CSA O141-05 (R2009): Softwood Lumber.

.8 CSA O151-09: Canadian Softwood Plywood.

.9 National Hardwood Lumber Association (NHLA): Grading Rules.

.10 National Lumber Grades Authority (NLGA): Standard Grading Rules for Canadian Lumber.

1.3 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Verification Samples: duplicate samples, as follows:
.1 Hardwood Plywood: 300 x 300 mm size, illustrating full panel sheet, edge and joint trim.
.2 Hardwood Trim: 300 mm long, illustrating size and shape of profiles, and quality of wood grain.

1.4 QUALIFICATIONS

.1 Trim and Finish Carpenter: firm with individuals specializing in finish carpentry work, and having minimum three years documented experience.

2 Products

2.1 MATERIALS

.1 Softwood Lumber (SL): SPF species, to CSA O141, maximum moisture content of 7 percent, with mixed grain, of quality capable of opaque finish; sizes as indicated on Drawings.

.2 Hardwood Lumber (HL): Red Oak species, to NHLA Select and Better Grade; maximum moisture content of 7 percent, with vertical grain, of quality capable of transparent finish; sizes as indicated on Drawings.

.3 Softwood Plywood (SP): CSP to CSA O151; SEL TF Grade; SPF veneer core of minimum 9 plies; thicknesses as indicated on Drawings; capable of receiving high quality opaque finish.

.4 Softwood Plywood - Moisture-Resistant (SP-MR): CSP to CSA O151; SEL TF Grade; composite core of moisture-resistant particle board to ANSI A208.1, Grade M-3 - Exterior Glue; thicknesses as indicated on Drawings; capable of receiving opaque finish.

.5 Hardwood Plywood (HP): to ANSI/HPVA HP-1, Architectural G1S, thicknesses as indicated on Drawings; as follows:
.1 Core: hardwood veneer core, minimum 9 plies.
.2 Face Veneers: Red Oak species; Face Grade AA; Flat Cut; of clear Book match grain capable of receiving transparent finish.

.6 Hardwood Plywood - Moisture-Resistant (HP-MR): to ANSI/HPVA HP-1, Architectural G1S, thicknesses as indicated on Drawings; as follows:
.1 Core: composite core, moisture-resistant particle board to ANSI A208.1, Grade M-3 - Exterior Glue.
.2 Face Veneers: Red Oak species; Face Grade AA; Flat Cut; of clear Book match grain capable of receiving transparent finish.

.7 Hardboard Panel (HBP): inter-felted ligno-cellulosic fibers consolidated under heat and pressure; minimum 500 kg/m^3 density; to ANSI A135.4, Class 1 - Tempered; S1S surface finish; thicknesses as indicated on Drawings.

2.2 ACCESSORIES

.1 High Pressure Decorative Laminate (HPDL): standard decorative laminate, as specified in Section 06 24 00.

.2 Solid Surfacing: as specified in Section 06 61 16.

.3 Contact Adhesives: water base type.

.4 Wall Adhesive: solvent release, cartridge type, compatible with wall substrate, capable of achieving durable bond.

.5 Nails: Size and type to suit application, plain finish.

.6 Driven Fasteners: nails, spikes and staples, steel with plain finish, to ASTM F1667; length to suit application.

.7 Bolts, Nuts, Washers, Blind fasteners, Lags, and Screws: Size and type to suit application; plain finish.

.8 Shimming, Blocking, and Strapping: lumber as specified in Section 06 10 00.

.9 Primer: alkyd primer sealer type.

.10 Wood Filler: Solvent base, tinted to match surface finish colour.

2.3 FINISHES

.1 Chrome/Nickel Plating on Metal Components: to ASTM B456, Type SC 2; Polished.

3 Execution

3.1 INSTALLATION

.1 Install Products to AWMAC Architectural Woodwork Standards, Premium Grade.

.2 Set and secure Products in place, plumb and level.

.3 Install Products with nails, screws, or bolts with blind fasteners at 400 mm OC; or wall adhesive by gun application as required by specific installation requirements.

.4 Cover exposed plywood sheet edges with 10 mm thick hardwood edge banding.

.5 Apply high pressure decorative laminate as specified in Section 06 24 00.

.6 Apply solid surfacing as specified in Section 06 61 16.

.7 Install wood doors as specified in Section 08 14 00.

.8 Install finish hardware as specified in Section 08 71 00.

.9 Seal gaps and joints as specified in Section 07 92 00.

3.2 ADJUSTING AND CLEANING

.1 Set exposed fasteners.

.2 Apply wood filler in exposed fastener indentations. Allow to dry and sand smooth, ready for site finishing.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 20 00 - Finish Carpentry.

.2 Section 06 40 00 - Architectural Woodwork.

.3 Section 06 61 16 - Solid Surfacing Fabrications.

.4 Section 10 21 13.19 - Plastic Toilet Compartments.

1.2 REFERENCES

.1 ANSI/NEMA LD 3-2005: High Pressure Decorative Laminates.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC): Architectural Woodwork Standards, Edition 2-2014.

.3 CAN/CGSB-71.20-M88: Adhesive, Contact, Brushable.

1.3 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: duplicate chains of laminate samples, illustrating available colours and surface textures.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver HPDL with heavy kraft paper protection and store in cartons during shipping.

.3 Protect HPDL surfaces during fabrication and installation stages; do not remove protective covering until final clean-up prior to final inspection.

.4 Do not store or install Products in areas where relative humidity is less than 25 percent or greater than 60 percent at 22 degrees Celsius.

1.5 WARRANTY

.1 Submit an extended system warranty in accordance with the General Conditions of the Contract.

.2 Extended System Warranty: 2 year extended warranty including coverage against warping, splitting, or delamination, subject to normal usage excluding excessive moisture or heat.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
- .1 Arborite.
- .2 Formica.
- .3 Nevamar.
- .4 Octolam.
- .5 Pionite.
- .6 Wilsonart.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Standard Decorative Laminate: high pressure decorative laminate (HPDL) consisting of decorative surface papers impregnated with melamine resins, bonded under heat and pressure to kraft papers impregnated with phenolic resins; colours and patterns as selected by Consultant; to ANSI/NEMA LD 3, Types, Grades and thicknesses as listed below:
- .1 General Purpose Type
  - .1 Grade: HGS;
  - .2 Thickness: 1.2 mm.
- .2 Vertical Surface Type
  - .1 Grade: VGS;
  - .2 Thickness: 0.7 mm.
- .3 Postforming Type
  - .1 Grade: HGP;
  - .2 Thickness: 1.0 mm.
- .4 Vertical Postforming Type
  - .1 Grade: VGP;
  - .2 Thickness: 0.7 mm.
- .5 Cabinet Liner Type
  - .1 Grade: CLS;
  - .2 Thickness: 0.5 mm.
- .6 Backer Type
  - .1 Grade: BKL;
  - .2 Thickness: 0.7 mm.

.2 Cores: as indicated on Drawings.

.3 Sealer: water resistant, acceptable to laminated plastic manufacturer.

.4 Draw Bolts and Splines: for new core bases, acceptable to fabricator.

.5 Adhesive: contact adhesive, to CAN/CGSB-71.20-M, as recommended by laminated plastic manufacturer.

3 Execution

3.1 INSTALLATION

.1 Comply with ANSI/NEMA LD 3, Annex A and AWMAC Architectural Woodwork Standards.

.2 Install Products plumb, true and square, neatly scribed and fitted to adjoining surfaces. Gaps at corners or between trim and back-up materials will be rejected by Consultant.

.3 Use draw bolts and splines to form tight, flush hairline joints in core materials.

.4 Ensure cutouts are prepared for faucets, sinks and other penetrating items. Round internal corners, chamfer edges and seal exposed core edges.

.5 Ensure adjacent laminate sheets match in colour and pattern.

.6 Apply HPDL to core materials as recommended by laminate and adhesive manufacturers.

.7 Ensure HPDL and core profiles coincide to ensure full continuous support and bond over entire surface.

.8 Use continuous lengths to minimize joints; maintain joints a minimum of 600 mm from sink cutouts. Offset joints in plastic facing from core joints.

.9 Provide postformed counter tops with 180 degrees front roll or D-Wrap and 65 mm rolled backsplash.

.10 Apply HPDL to exposed edges of core material for straight self-edging strips or flat work. Chamfer exposed edges uniformly at 20 degrees; do not mitre laminate edges.

.11 Apply backing sheets where required to conceal and balance core material.

.12 Apply cabinet liner sheets to interior of cabinets where indicated on Drawings.

3.2 CLEANING

.1 Refer to Division 01.

.2 Remove kraft paper protective covering.

.3 Visually inspect each installed item, wash and thoroughly polish surfaces.

3.3 PROTECTION

.1 Refer to Division 01.

.2 Protect completed installation from damage with removable temporary protective covering until Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 20 00 - Finish Carpentry.

.2 Section 06 24 00 - High Pressure Decorative Laminate.

.3 Section 06 61 16 - Solid Surfacing Fabrications.

.4 Section 07 92 00 - Joint Sealants.

1.2 REFERENCES

.1 ANSI A135.4-2004: Basic Hardboard.

.2 ANSI/HPVA HP-1-2009: American National Standard for Hardwood and Decorative Plywood.

.3 ANSI/NEMA LD 3-2005: High Pressure Decorative Laminates.

.4 Architectural Woodwork Manufacturers Association of Canada (AWMAC): Architectural Woodwork Standards, Edition 2-2014.

.5 ASTM A240/A240M-16: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.6 ASTM B456-11e1: Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.7 ASTM F1667-15: Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.8 Canadian Hardwood Plywood and Veneer Association (CHPVA): Official Grading Rules for Canadian Hardwood Plywood.

.9 CSA O112.9-10: Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).

.10 CSA O112.10-08 (R2013): Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).

.11 CSA O141-05 (R2009): Softwood Lumber.

.12 CSA O151-09: Canadian Softwood Plywood.

.13 National Lumber Grades Authority (NLGA): Standard Grading Rules for Canadian Lumber.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, finishes, accessories, locations of outlets, anchorage, and hardware.

1.4 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Verification Samples: duplicate samples, as follows:
  .1 Hardwood Panel: 300 x 300 mm size, illustrating full panel sheet, edge trim, joint trim, and shop-applied finish.
  .2 Hardwood Trim: 300 mm long, illustrating profile sizes and shapes, quality of wood grain, and shop-applied finish.

1.5 QUALIFICATIONS

.1 Fabricator and Installer: a firm specializing in the fabrication and installation of custom-fabricated casework, having a minimum of 3 years documented experience, and a member in good standing of the Architectural Woodwork Manufacturers Association of Canada.

1.6 MOCKUPS

.1 Construct mockup as specified in Division 01.

.2 Mockup: full size sample of custom-fabricated casework, including materials, finishes and hardware specified.

.3 The accepted mockup will be used as a standard for acceptance of the Work.

.4 Accepted mock-up may remain as part of the completed Work. Protect from damage.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Store Products under waterproof cover both in transit and at the Place of the Work in a manner to prevent damage to Products, to any existing building or property or to the Work.

.3 Store completed Products in a dry, clean area where it does not hinder the progress of the Work.

.4 Do not store or install Products in the Work until the building is dry and heated.

1.8 WARRANTY

.1 Submit a 24 month AWMAC warranty or a 24 month 100 percent maintenance bond in accordance with the General Conditions of the Contract.

.2 Warranty: Architectural Woodwork Manufacturer's Association of Canada standard Certificate of Guarantee, certifying that the work of this Section has been manufactured and installed in accordance with the specified standards incorporated in the AWMAC Architectural Woodwork Standards.

2 Products

2.1 MATERIALS

.1 Hardwood Plywood (HP): to ANSI/HPVA HP-1, Architectural G2S, thicknesses as indicated on Drawings; as follows:
  .1 Core: hardwood veneer core, minimum 9 plies.
  .2 Face Veneers: Red Oak species; Face Grade AA; Flat Cut; of clear Book match grain capable of receiving transparent finish.

.2 Hardwood Plywood - Moisture-Resistant (HP-MR): to ANSI/HPVA HP-1, Architectural G2S, thicknesses as indicated on Drawings; as follows:
  .1 Core: composite core, moisture-resistant particle board to ANSI A208.1, Grade M-3 - Exterior Glue.
  .2 Face Veneers: Red Oak species; Face Grade AA; Flat Cut; of clear Book match grain capable of receiving transparent finish.

.3 Hardwood Lumber (HL): Red Oak species, to NHLA Select and Better Grade; maximum moisture content of 7 percent, with vertical grain, of quality capable of transparent finish; sizes as indicated on Drawings.

.4 Softwood Plywood (SP): CSP to CSA O151; SEL TF Grade; SPF veneer core of minimum 9 plies; thicknesses as indicated on Drawings; capable of receiving HPDL finish.

.5 Softwood Plywood - Moisture-Resistant (SP-MR): CSP to CSA O151; SEL TF Grade; composite core of moisture-resistant particle board to ANSI A208.1, Grade M-3 - Exterior Glue; thicknesses as indicated on Drawings; capable of receiving HPDL finish.

.6 Softwood Lumber (SL): SPF species to CSA O141, S-Dry; NLGA Light Framing classification, Standard and Better Common Grade Mix; sizes as indicated on Drawings.

.7 Hardboard Panel (HBP): inter-felted ligno-cellulosic fibers consolidated under heat and pressure; minimum 500 kg/m^3 density; to ANSI A135.4, Class 1 - Tempered; S1S surface finish; complete with low pressure decorative laminate (LPDL) thermo-fused to one side; thicknesses as indicated on Drawings; colours and patterns as selected by Consultant.

2.2 ACCESSORIES

.1 Adhesive for Wet Area Exposures: to CSA O112.9.

.2 Adhesive for Dry Area Exposures: to CSA O112.10.

.3 Fasteners: size and type to suit application, plain finish.

.4 Driven Fasteners: nails, spikes and staples, steel with plain finish, to ASTM F1667; length to suit application.

.5 High Pressure Decorative Laminate (HPDL): standard decorative type, as specified in Section 06 24 00.

.6 Solid Hardwood Edgebanding: 3 mm thick hardwood edgebanding, species and grain to match cabinet panel faces, unless noted otherwise.

.7 Tackable Surface: 6 mm thick linoleum-based cork sheet, Krommenie by Forbo Linoleum Inc., colour as selected by Consultant.

.8 Solid Surfacing: as specified in Section 06 61 16.

.9 Joint Sealants: as specified in Section 07 92 00.

.10 Base Cabinet Leveller: 100 mm size, adjustable to minus 5 mm and plus 10 mm; Model 637.45.326 by Hafele.

2.3 FABRICATION

.1 Prior to fabrication, verify existing conditions and take field measurements necessary to ensure a perfect fit.

.2 Fabricate Products to AWMAC Architectural Woodwork Standards, Premium Grade.

.3 Manufacture casework as individual cabinets in width increments of 450 mm, 600 mm, 750 mm, 900 mm, 1,200 mm, and 1,500 mm, or special widths where noted on Drawings.

.4 Fabricate each module to be self-supporting with both exterior gables finished to allow removal and relocation without any alteration to casework.

.5 Pre-drill and cut mounting holes for sinks, faucets and electrical receptacles.

.6 Provide solid hardwood edgebanding glued and nailed to hardwood panel ends and edges.

.7 Secure wall case and floor case bottoms to casework with three locking mechanical fasteners at each end.

.8 Secure fixed shelves, toe space rails, bottom rails, and top rails to casework with two locking fasteners at each end.

.9 Maximum unsupported span for shelves not to exceed 760 mm.

.10 All joints are to be a good fit, fully glued and rigid in final construction.

.11 Apply post-formed HPDL to countertop cores, as specified in Section 06 24 00.

.12 Factory seal cutouts and service fitting openings in countertops with a moisture-resistant epoxy.

2.4 FINISHES

.1 Shop finish hardwood Products to AWMAC Architectural Woodwork Standards, System 12 - POLYURETHANE, WATER-BASED, Custom Grade for Transparent finish; colour and sheen as selected by Consultant.

.2 Shop finish softwood Products to AWMAC Architectural Woodwork Standards, System 4 - LATEX ACRYLIC, WATER-BASED, Custom Grade for Opaque finish; colour and sheen as selected by Consultant.

.3 Chrome/Nickel Plating on Metal Components: to ASTM B456, Type SC 2; Satin.

.4 Stainless Steel: to ASTM A240/A240M, No. 4 - Brushed.

2.5 SOURCE QUALITY CONTROL

.1 Arrange for an AWMAC appointed inspector to inspect the work of this Section at the plant.

.2 Pay costs of AWMAC inspection.

.3 Make Good rejected Products and workmanship.

3 Execution

3.1 INSTALLATION

.1 Install Products to AWMAC Architectural Woodwork Standards, Premium Grade.

.2 Where practical, assemble finished wood work at the mill and deliver ready for installation.

.3 Accurately fit joints and miters and set nail heads ready for finishing.

.4 Set and secure materials and components in place, rigid, square and plumb.

.5 Provide wood blocking, framing or furring shown on Drawings as part of the millwork fabrication or erection.

.6 Accurately scribe and closely fit compounds to irregularities of adjacent surfaces.

.7 Use draw bolts and splines to form tight, flush, hairline joints. Accurately fit joints in true plane, locate joints over bearing or supporting surfaces.

.8 Provide heavy duty fasteners, securely anchoring cabinets to floor, ceiling and wall surfaces. Use only concealed type fasteners.

.9 Where permitted, secure concealed elements with small headed finishing nails. Countersink nail heads with nail setter.

.10 Provide sinks, service fittings and electrical outlets. Coordinate with other Sections for connection to building services.

.11 Where access is required to valves and other mechanical and electrical components located behind casework, Provide suitably removable wood access panels, each secured with minimum 4 brass screws.

.12 Provide closers and filler strips in matching finish as required to ensure a neat and complete finished assembly.

.13 Seal gaps and joints in wet areas with mildew-resistant joint sealer, and in non-wet areas with general purpose interior sealant. Conform to Section 07 92 00.

3.2 FIELD QUALITY CONTROL

.1 Arrange for an AWMAC appointed inspector to inspect the work of this Section after installation.

.2 Pay costs of AWMAC inspection.

.3 Make Good rejected Products and workmanship.

3.3 ADJUSTING

.1 Fill and touch up damaged finishes to match factory finish.

.2 Replace damaged Product that can not be repaired.

3.4 PROTECTION

.1 Refer to Division 01.

.2 Protect completed installation from damage by other Sections.

.3 Provide protective covering to protect installed Products until Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 06 20 00 - Finish Carpentry.

.3 Section 06 24 00 - High Pressure Decorative Laminate.

.4 Section 06 40 00 - Architectural Woodwork.

.5 Section 07 92 00 - Joint Sealants.

.6 Section 09 21 16 - Gypsum Board Assemblies.

.7 Section 09 30 00 - Tiling.

.8 Section 22 44 13 - Plumbing Fixtures Combined With Drawing Schedule.

1.2 REFERENCES

.1 ANSI A136.1-2012: Organic Adhesives for Installation of Ceramic Tile.

.2 ANSI Z124.3-95: Plastic Lavatories.

.3 ASTM C920-14a: Standard Specification for Elastomeric Joint Sealants.

.4 NSF/ANSI 51-2002: Food Equipment Materials.

.5 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: indicate product description, fabrication information and compliance with performance requirements.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent work.

1.5 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Samples: duplicate 100 x 100 mm size samples, indicating full range of colour and pattern variation. Approved samples will be retained as a standard of work.

1.6 TEST AND EVALUATION REPORTS

.1 Submit test reports as specified in Division 01.

.2 Test Reports: manufacturer's standard test results, including flammability tests results and food preparation zone test results, indicating Products meet the specified performance criteria, as prepared by an independent testing agency, and current within the past 5 years.

1.7 CERTIFICATES

.1 Submit certificates as specified in Division 01.

.2 Fabricator Qualification Certificates: proof of fabricator qualifications, including ISO certifications.

1.8 MANUFACTURER'S INSTRUCTIONS

.1 Submit manufacturer’s instructions as specified in Division 01.

.2 Manufacturer’s Instructions: including copies of manufacturer’s standard fabrication and installation manual.

1.9 CLOSEOUT SUBMITTALS

.1 Submit maintenance data as specified in Division 01.

.2 Maintenance Data: maintenance care and maintenance data, including repair and cleaning instructions, for inclusion in Maintenance Manual.

1.10 QUALIFICATIONS

.1 Fabricator: minimum 3 years experience in fabricating solid surface materials, or a distributor’s certification comprised of content acceptable to Owner.

.2 Installer: minimum 3 years experience with installing solid surface materials, or a distributor’s certification comprised of content acceptable to Owner.

.3 Manufacturer’s Certification: current ISO 9002 and 14001 certificates.

1.11 MOCK-UPS

.1 Prior to acceptance of Shop Drawings, erect one full size mock-up of each component required, as specified in Division 01.

.2 Consultant will review mock-up.

.3 Remove rejected mock-up components from site. Refabricate and reinstall mock-up components, and request additional Consultant review.

.4 Accepted mock-ups may remain as part of the Work.

1.12 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products only when areas are ready for installation.

.3 Deliver and store Products in original unopened containers with manufacturer's labels intact.

.4 Store Products in a warm and dry location.

.5 Handle Products to prevent damage to finished surfaces.

1.13 WARRANTY

.1 Submit an extended warranty in accordance with the General Conditions of the Contract.

.2 Manufacturer’s Extended Warranty: Ten year limited warranty against manufacturing defects in sheet material.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Formica.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Solid Surface Sheet: 13 mm thick, homogeneous sheet composed of a blend of natural minerals and 100 percent acrylic resin; to ANSI Z124.3; and meeting the following criteria:
.1 Flammability (CAN/ULC S102): Class A.
.2 Food Equipment Material Compliance: Food Zone to NSF / ANSI 51.
.3 Finish: Semi-Gloss.
.4 Colour: 781 - Luna Concrete by Formica.
.5 Product and Manufacturer’s Name: Classics by Formica.

.2 Under Counter Perimeter Frame: 19 mm thick, moisture-resistant softwood plywood, Type SP-MR as specified in Section 06 20 00.

.3 Adhesive for Bonding Solid Surfacing: two-component epoxy.

.4 Adhesive for Bonding to Other Products: one-component silicone, to ASTM C920.

.5 Bowl and Sink Mounting Hardware: manufacturer's standard bowl clips, brass inserts and fasteners designed for attachment of under mount bowls and sinks.

.6 Joint Sealant: mildew-resistant silicone sealant, as specified in Section 07 92 00.

2.3 FABRICATION

.1 Comply with manufacturer's fabrication and installation manual.

.2 Fabricate components in shop to greatest extent practical, to sizes and profiles indicated in approved Shop Drawings.

.3 Form joints between components to be inconspicuous in appearance and without voids.

.4 Avoid placing joints within 25 mm of inside or outside corners.

.5 Attach 50 mm wide reinforcing strip of solid surfacing material under each joint and seam.

.6 Provide holes and cutouts for bowls, sinks, plumbing fixtures and accessories as indicated on Drawings.

.7 Thermoform corners and edges to shapes and sizes indicated on Drawings, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches. Heat entire component uniformly prior to forming.

.8 Ensure no blistering, whitening and cracking of components during forming.

.9 Form backsplashes from 13 mm thick solid surfacing material, with 13 mm radius cove at where counter and backsplash meet.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify that supports are level to within 3 mm in 3.0 metres.

3.2 INSTALLATION

.1 Install countertops straight, plumb and level, and securely attached to supports.

.2 Form field joints using manufacturer's recommended adhesive. Make joints inconspicuous in finished work.

.3 Secure under mount bowls and sinks to countertops with manufacturer's recommended clip system.

.4 Secure seam mount bowls and sinks to countertops with joint adhesive.

.5 Provide field-installed backsplashes and endsplashes, adhered to countertops using colour-matched joint adhesive.

.6 Seal between wall and components with joint sealant, as specified in Section 07 92 00.

.7 Coordinate connection of plumbing fixtures with Section 22 44 13.

3.3 ADJUSTING

.1 Repair minor imperfections and cracked seams and replace areas of severely damaged surfaces in accordance with manufacturer's fabrication and installation manual.

3.4 CLEANING

.1 Refer to Division 01.

.2 Remove excess adhesive and sealant from visible surfaces.

.3 Clean surfaces in strict accordance with manufacturer's care and maintenance instructions.

3.5 PROTECTION

.1 Refer to Division 01.

.2 Protect surfaces from damage with heavy paper or cardboard covers.

.3 Maintain protection until Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealants.

1.2 REFERENCES

.1 ASTM C957/C957M-15: Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface.

.2 CAN/ULC S102.2-10: Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

1.3 PRODUCT DATA

.1 Submit material safety data sheets as specified in Division 01.

.2 Material Safety Data Sheets: WHMIS sheets, acceptable to authorities having jurisdiction, describing elastomeric coatings. Indicate VOC content.

1.4 CLOSEOUT SUBMITTALS

.1 Submit maintenance data as specified in Division 01.

.2 Maintenance Data: describing maintenance of pedestrian traffic coatings, for incorporation in the operating and maintenance manual.

1.5 MANUFACTURER REPORTS

.1 Submit manufacturers' reports as specified in Division 01.

.2 Manufacturers' Reports: Manufacturer field review reports, as specified below.

1.6 QUALIFICATIONS

.1 Applicator: company specializing in the work of this Section, licensed by the membrane manufacturer as an approved applicator.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver and store Products in original containers with manufacturer's labels and seals intact. Protect containers from damage.

.3 Protect liquid materials from freezing, and from long-term exposure to sunlight. Maintain ambient temperature in storage area at 22 degrees Celsius.

.4 Protect sheet materials from damage, moisture, and direct sunlight. Store sheet membranes between 5 degrees Celsius and 30 degrees Celsius.

1.8 AMBIENT CONDITIONS

.1 Temperature: minimum temperature of substrate and ambient air must be not less than 10 degrees Celsius.

.2 Ventilation:
.1 Ventilate enclosed spaces, minimum 1 air change per hour.
.2 Provide continuous ventilation during and after coating application.

1.9 WARRANTY

.1 Submit an extended warranty in accordance with the General Conditions of the Contract.

.2 Extended Warranty: for a period of 5 years, covering against leakage or failure of the material, whether caused due to faulty manufacture or installation.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers of polyurethane traffic-bearing coatings having Product considered acceptable for use:
.1 BASF.

.2 Manufacturers of epoxy traffic-bearing coatings having Products considered acceptable for use:
.1 PPG Protective & Marine Coatings.

.3 Substitution Procedures: Refer to Division 01.

2.2 DESCRIPTION

.1 Polyurethane Traffic-Bearing Coating: multi-layer, liquid-applied, traffic-bearing polyurethane-based membrane complete with embedded aggregate, capable of accommodating pedestrian traffic; MasterSeal Traffic 1500 by BASF.

.2 Epoxy Traffic-Bearing Coating: multi-layer, liquid-applied, traffic-bearing epoxy-based membrane complete with embedded aggregate, capable of accommodating pedestrian traffic; Aquapon 97-130 Series by PPG Protective & Marine Coatings.

2.3 REGULATORY REQUIREMENTS

.1 Fire Resistance (CAN/ULC S102.2): Class A.

.2 Ensure material containers bear ULC label.

.3 Comply with governing VOC regulations.

2.4 MATERIALS

.1 Polyurethane Traffic-Bearing Coating (PTC-1): elastomeric polyurethane traffic coating, with aggregate surface finish, to ASTM C957/C957M; comprised of the following components:
.1 Primer: two-component waterborne epoxy primer and sealer; MasterSeal P220 by BASF.
.2 Sheet Flashing: 1.5 mm thick uncured, non-staining neoprene elastomeric sheet; 150 mm and 305 mm wide.
.3 Liquid Flashing: polyurethane elastomeric liquid flashing.
.4 Aggregate: uniformly graded using a 16/30 mesh, minimum hardness of 6.5+ on Moh's scale.
.5 Base Coat: one-component, self-leveling, moisture-curing polyurethane; 0.5 mm dry film thickness; MasterSeal M 200 by BASF.
.6 Intermediate Coat: one-component, aliphatic moisture-curing polyurethane; 0.4 mm dry film thickness; MasterSeal TC 225 by BASF.
.7 Tinted Top Coat: one-component, aliphatic moisture curing tinted polyurethane; 0.4 mm dry film thickness; MasterSeal TC 225 Tint Base by BASF, Charcoal Gray colour.
.8 Sealant: polyurethane sealant.

.2 Epoxy Traffic-Bearing Coating (ETC-1): two-component, high build polyamide epoxy with aggregate surface finish, comprised of the following components:
.1 Primer: two-component, penetrating, moisture tolerant, epoxy primer.

.2 Undercoat: two-component, free flowing epoxy formulation consisting of resin and curing agent.
.3 Aggregate: silica sand aggregate, broadcast into both primer and undercoat.
.4 Sealer: high performance, UV resistant, two-component clear epoxy sealer.
.5 Colour: Light Grey, Semi-Gloss.

.3 Sheet Membrane Adhesive: as recommended by membrane manufacturer.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify surfaces are sound, unfrozen, clean, smooth and free of fins, sharp edges, large voids and cracks.

.3 Verify that proper slope to drain has been provided.

.4 Verify that deck penetrations are properly installed and secure.

.5 Verify that critical areas around the immediate vicinity of installation are suitably protected.

.6 Verify that weather and temperature conditions meet product specifications prior to the commencement of Work.

.7 Verify concrete surfaces are properly cured and have been steel trowel finished to a soft broom finish.

.8 Verify damaged or cracked concrete is repaired.

3.2 PREPARATION

.1 Protect adjacent surfaces and equipment from damage by overspray of liquid materials, fall-out and dusting. Ensure the following protective measures are taken:
.1 Post warning signs a minimum of 30 metres from the area of work.
.2 Cover all intake vents near the area of work.
.3 Erect wind breaks as necessary.
.4 Minimize or exclude all personnel not directly involved with coating application.
.5 Provide adequate ventilation.

.2 Clean substrate of matter which would affect bond of applied coating. Refer to coating manufacturer's recommendations for substrate preparation.

.3 If deemed necessary, shotblast concrete surfaces to remove laitance from existing concrete surfaces.

.4 Bridge cracks and cold joints as directed by manufacturer.

.5 Control Joints: Seal control joints. Apply sealant to inside area of joint only. Apply base coat material over sealed joints minimum 50 mm on each side of joint, to a minimum dry film thickness of 0.75 mm.

.6 Install sheet flashing as and where recommended by membrane manufacturer or as indicated on Drawings.

3.3 APPLICATION

.1 Apply primer at manufacturer's recommended rate. Allow to dry.

.2 Apply pedestrian traffic coatings within 24 hours or re-prime surfaces.

.3 Apply pedestrian traffic coatings in multiple coats, to the minimum dry film thickness as recommended by manufacturer.

.4 Extend base coat over cracks and control joints.

.5 Permit base coat to cure before applying top coat.

.6 Backroll aggregate into base and top coats while still wet, applied at manufacturer's recommended rate. Once dry, remove excess aggregate.

3.4 FIELD QUALITY CONTROL

.1 Refer to Division 01.

.2 Inspection and Testing: Verify total dry film thickness equals manufacturer's recommended minimum values, exclusive of aggregate.

.3 Conduct tests using a Tooke Mark II coating inspection gauge.

3.5 MANUFACTURER SERVICES

.1 Arrange for manufacturer's representative to be present prior to commencement of installation.

.2 Consult with manufacturer's representative as to field conditions.

.3 Arrange for manufacturer's representative to regularly inspect the installation.

.4 Submit written field review reports, confirming the installation is in strict accordance with manufacturer's recommendations.

3.6 CLEANING

.1 Refer to Division 01.

.2 Remove material which stains other surfaces.

.3 Clean surfaces to coating manufacturer's printed instructions.

3.7 PROTECTION

.1 Refer to Division 01.

.2 Protect coated surfaces from traffic until completely cured, but not less than 48 hours.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 07 84 00 - Firestopping.

.2 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

.1 ASTM C612-14: Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

.2 ASTM C847-14a: Standard Specification for Metal Lath.

.3 ASTM E84-16: Standard Test Method for Surface Burning Characteristics of Building Materials.

.4 ASTM E119-16a: Standard Test Methods for Fire Tests of Building Construction and Materials.

.5 ASTM E605/E605M-93(2015)e1: Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members.

.6 ASTM E736/E736M-00(2015)e1: Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.

.7 ASTM E759/E759M-92(2015)e1: Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.

.8 ASTM E760/E760M-92(2015)e1: Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members.

.9 ASTM E761/E761M-92(2015)e1: Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.

.10 ASTM E859/E859M-93(2015)e1: Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members.

.11 ASTM E937/E937M-93(2015)e1: Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members.

.12 ASTM E1513/E1513M-93(2015)e1: Standard Practice for Application of Sprayed Fire-Resistive Materials (SFRMs).

.13 AWCI Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials.

.14 CAN/ULC S101-07: Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.15 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.16 CAN/ULC S114-05: Standard Method of Test for Determination of Non-Combustibility in Building Materials.

.17 Underwriters Laboratories of Canada (ULC) List of Equipment and Materials.

1.3 SEQUENCING

.1 Perform fire protection work on a given floor prior to proceeding with fire protection work on the next floor.

.2 Coordinate and schedule the fire protection work to avoid delays in the progress of the Work.

.3 Do not install board fire protection on structural members until piping and other construction behind the fire protection has been completed, uninterrupted coverage can be provided and the need for subsequent cutting and patching can be eliminated.

1.4 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: Include certifications, to show compliance with Contract Documents.

1.5 TEST AND EVALUATION REPORTS

.1 Submit test reports as specified in Division 01.

.2 Test Reports: manufacturer's standard test results indicating Products meet the specified performance criteria, as prepared by an independent testing agency, and current within the past two years.

1.6 QUALIFICATIONS

.1 Installer: a firm specializing in the installation of sprayed fire-resistive materials, licensed or otherwise approved by the spray-applied fire resistive material manufacturer, and having a minimum of 5 years documented experience.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products to the Place of the Work in manufacturer's unopened packages, fully identified as to trade name, type and other identifying data. Packaging shall bear the UL labels for fire hazard and fire-resistance classifications.

.3 Store Products above ground, in a dry location, protected from the weather. Remove damaged packages found unsuitable for use from the Place of the Work.

1.8 AMBIENT CONDITIONS

.1 When the prevailing outdoor temperature at the building is less than 4 degrees Celsius, maintain a minimum substrate and ambient temperature of 4 degrees Celsius prior to, during and a minimum of 24 hours after application of the spray-applied fire resistive material.

.2 If necessary for job progress, provide heated protective enclosures to maintain temperatures. Refer to Division 01.

.3 Provide adequate ventilation of not less than 4 air changes per hour to allow proper drying of the spray-applied fire resistive material during and subsequent to its application.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Cafco Industries Inc.

.2 Substitution Procedures: refer to Division 01.

2.2 PERFORMANCE CRITERIA

.1 Spray-Applied Fire Resistive Coating
  .1 Deflection: When tested to ASTM E759/E759M, the material shall not crack or delaminate when the non-concrete topped galvanized deck to which it is applied is subjected to a one time vertical centerload resulting in a downward deflection of 1/120th of the span.
  .2 Bond Impact: When tested to ASTM E760/E760M, the material shall not crack or delaminate from the concrete topped galvanized deck to which it is applied.
  .3 Cohesion/Adhesion (bond strength): When tested to ASTM E736/E736M, the material applied over uncoated or galvanized steel shall have an average bond strength of 15.9 kPa.
  .4 Air Erosion: When tested to ASTM E859/E859M, the material shall not be subject to losses from the finished application greater than 0.27 grams per square metre.
  .5 Compressive Strength: When tested to ASTM E761/E761M, the material shall not deform more than 10 percent when subjected to a crushing force of 85.7 kPa.
  .6 Corrosion Resistance: When tested to ASTM E937/E937M, the material shall not promote corrosion of steel.
  .7 Non-combustibility: When tested to CAN/ULC S114, the material shall be noncombustible.
  .8 Surface Burning Characteristics: When tested to ASTM E84 or CAN/ULC S102, the material shall exhibit the following surface burning characteristics:
    .1 Flame Spread = 0
    .2 Smoke Developed = 0
  .9 Density: When tested to ASTM E605/E605M, the material shall meet the minimum individual and average density values as listed in the appropriate UL/ULC design or as required by the authority having jurisdiction, or shall have a minimum average of 280 kg/m^3.
  .10 Conform to procedures for conducting tests and reporting tested values to CAN/ULC S101.
  .11 Spray-applied fire resistive materials shall be applied at the required thickness and density to achieve the ratings as noted on Drawings.

2.3 MATERIALS

.1 Spray-Applied Fire Resistive Material (SFRM): wet-mix type, free of asbestos; Light Green colour; Cafco 300SB by Cafco Industries Inc.

.2 Refractory Mineral Wool Board Fire Protection: Rigid boards to ASTM C612, Class 4; 144 kg/m^3 nominal density; produced from asbestos free materials by combining refractory mineral wool manufactured from slag with thermosetting resin binders; and having the following physical properties:
  .1 Thermal Resistance: RSI 0.76 @ 24 degrees C.
  .2 Surface Burning Characteristics: Flame Spread = 15, Smoke Developed = 5.
  .3 Manufacturer and Product Name: Cafco-board Mineral Wool Board Fire Protection by Cafco Industries Inc.

.3 Fastening Accessories: For each fire resistive assembly in which mineral wool board fire protection serves as rigid fire protection, provide a board fastening system complying with the related UL design or other acceptable testing and inspecting organization's report.

.4 Metal Lath: galvanized type, 1.4 kg/m^2, to ASTM C847.

.5 Water: Potable.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Ensure surfaces to receive fire protection are free of oil, grease, loose mill scale, dirt, paints/primers (other than those listed and tested) or other foreign materials which would impair satisfactory bonding to the surface.

.3 Ensure clips, hangers, supports, sleeves and other attachments to the substrate are to be placed by others prior to the application of spray-applied fire resistive materials.

.4 Ensure that the installation of ducts, piping, conduit or other suspended equipment shall not take place until the application of sprayed fire protection is complete in an area.

3.2 PREPARATION

.1 Prepare substrates in accordance with Underwriters' Laboratories of Canada (ULC) clarification entitled Sprayed-Applied Fire-Resistive Materials New Requirements for the Use of Sprayed-Applied Fire-Resistive Materials on Primed Steel Surfaces.

.2 Provide bonding agents and metal lath as required.

3.3 APPLICATION

.1 Apply sprayed fire-resistive materials to ASTM E1513/E1513M.

.2 Do not apply fire protection to steel floor decks prior to the completion of concrete work on that deck.

.3 Provide masking, drop cloths or other suitable coverings to prevent overspray from coming in contact with surfaces not intended to be sprayed.

.4 Apply bonding materials as per the identified ULC fire resistance design and the manufacturer's written recommendations.

.5 Topcoat materials shall be the type recommended and approved by the manufacturer of each spray-applied fire resistive material required for the applications indicated.

.6 Install mineral wool board fire protection to comply with requirements for thicknesses, number of layers, construction of joints and corners, and fastening methods referenced in the appropriate fire resistance design indicated.

.7 Coordinate installation of board fire protection with other construction to minimize cutting into, or removal of, already installed board material.

3.4 FIELD QUALITY CONTROL

.1 Test sprayed fire-resistive material for thickness and density to ASTM E605/E605M or the AWCI Standard Practice for the Testing and Inspection of Field-Applied Sprayed Fire-Resistive Materials.

3.5 ADJUSTING

.1 Make Good damaged fire protection.

3.6 PROTECTION

.1 Protect completed installation as specified in Division 01.

.2 Provide final protection and maintain conditions in a manner acceptable to Consultant and authorities having jurisdiction.

.3 Ensure installed Products are not damaged at time of final inspection.

.4 Make Good damaged Products before Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 05 50 00 - Metal Fabrications.

.3 Section 07 92 00 - Joint Sealants.

.4 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

.1 ASTM C303-10: Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation.

.2 ASTM C1104/C1104M-13a: Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.

.3 ASTM E84-16: Standard Test Method for Surface Burning Characteristics of Building Materials.

.4 ASTM E119-16a: Standard Test Methods for Fire Tests of Building Construction and Materials.

.5 ASTM E814-13: Standard Test Method for Fire Tests of Penetration Fire Stop Systems.

.6 ASTM E2174-14b: Standard Practice for On-Site Inspection of Installed Fire Stops.

.7 CAN/ULC S101-07: Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.8 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.9 CAN/ULC S114-05: Standard Method of Test for Determination of Non-Combustibility in Building Materials.

.10 CAN/ULC S115-11: Standard Method of Fire Tests of Firestop Systems.

.11 CAN/ULC S129-06: Standard Method of Test for Smoulder Resistance of Insulation (Basket Method).

.12 CAN/ULC S702-09-AM1: Standard for Mineral Fibre Thermal Insulation for Buildings.

.13 Underwriters' Laboratories of Canada: List of Equipment & Materials.

1.3 PREINSTALLATION MEETINGS

.1 Prior to commencement of firestopping, arrange and conduct a pre-installation meeting as specified in Division 01.

.2 Pre-installation Meeting: discuss proposed methods and materials to be used in instances.

.3 Representatives of the Owner, Consultant, Contractor, installer, manufacturer and the authority having jurisdiction are to be in attendance. Do not conduct meeting unless identified parties are present.

1.4 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: sealant manufacturer's installation instructions and standard drawings, indicating ULC or WHI test designations.

1.5 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate sizes of openings, nature of penetrations, and tested method of firestop and smoke seal protection being proposed.
.1 Shop Drawings are to be sealed, signed and dated by manufacturer's design engineer.
.2 Submit Shop Drawings to Consultant and to the authority having jurisdiction for their review and approval.

1.6 CERTIFICATES

.1 Submit certification as specified in Division 01.

.2 Certificate: sealant manufacturer's letter of certification verifying that Products meet or exceed specified requirements.

1.7 TEST AND EVALUATION REPORTS

.1 Submit test reports as specified in Division 01.

.2 Test Reports: manufacturer's standard test results indicating Products meet the specified performance criteria, as prepared by an independent testing agency, and current within the past two years.

1.8 FIELD QUALITY CONTROL SUBMITTALS

.1 Submit manufacturer's field inspection reports as specified in Division 01.

.2 Manufacturer's Field Inspection Reports: manufacturer's written acceptance of installation based on regular inspections.

1.9 QUALIFICATIONS

.1 Manufacturer's Design Engineer: a registered professional engineer licensed to practice in the Place of the Work and having a minimum of 10 years documented experience designing firestop and smoke seal systems.

.2 Installer: a firm specializing in the installation of firestopping and smoke seal systems, approved or certified as an installer by the Product manufacturer.

1.10 MOCK-UPS

.1 Construct job site mock-up as specified in Division 01.

.2 Apply one sample seal on representative substrates on each site for each fire rating required at each type of wall, floor or roof construction.

.3 Comply with project requirements as to thickness and density of application to achieve fire rating.

.4 Proceed with installation only after Consultant has reviewed and accepted mock-up.

.5 Acceptable mockup may remain as part of the completed Work as standard.

1.11 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products to the Place of the Work in their original unopened packages.

.3 Store Products in an enclosed shelter, preventing damage to containers.

1.12 AMBIENT CONDITIONS

.1 Do not apply sealants when temperature of substrate material and surrounding air is below 5 degrees Celsius.

.2 Maintain sealant at a minimum 18 degrees Celsius for best workability.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
- .1 3M Company Canada.
- .2 AD Fire Protection.
- .3 Hilti Canada.
- .4 Nuco Inc.
- .5 Specified Technologies Inc.
- .6 Tremco.
- .7 The Rectorseal Corporation.

.2 Substitution Procedures: refer to Division 01.

2.2 DESIGN AND PERFORMANCE CRITERIA

.1 Seal empty holes and penetrations at floors, fire rated walls and smoke barrier walls.

.2 Seal holes accommodating penetrating items such as cables, cable trays, pipes, ducts and conduits.

.3 Design firestopping system to maintain integrity of time rated construction by providing a sealant against the spread of heat, flame and smoke.

.4 Systems shall be ULC or ULI classified or listed by WHI for the appropriate required time rating.

.5 Provide firestopping and smoke sealing systems to CAN/ULC S115 and as described below:
- .1 Asbestos free materials and systems fully capable of maintaining an effective barrier against gases, flame and smoke in compliance with CAN/ULC S115, not exceeding opening sizes stated.
- .2 Service Penetration Assemblies: certified by CAN/ULC S115 and used by ULC Guide 40 U19. Service components listed as certified in this guide are noted under Label Service of ULC.

.6 Fire resistance rating of fire stopping material assembly must meet or exceed the fire resistance rating of the floor or wall section being penetrated.

.7 Firestopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal; do not use a cementitious or rigid seal at such locations.

.8 Damming and back up materials, supports and anchoring devices shall be to manufacturer's recommendations, and in strict accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.9 Firestopping compounds shall not contain volatile solvents or require special application to protect plastic pipe from firestopping compound.

2.3 MATERIALS

.1 Primer: as recommended by sealant manufacturer for specific material, substrate and end use.

.2 Firestop Accessories: firestop foams, boards, blocks, collars, wraps, puttys and plugs; to CAN/ULC S115; ULC labelled; types as listed in tested assemblies.

.3 Firestop Insulation: to CAN/ULC S702, Type 2; mineral fibre manufactured from rock or slag, suitable for manual application; and having the following physical properties when tested to the identified standard:
- .1 Density (ASTM C303): 72 kg/m^3.
- .2 Combustibility (CAN/ULC S114): Noncombustible.
- .3 Melt Temperature: >1175 degrees C.
- .4 Surface Burning Characteristics: to CAN/ULC S102, as follows:
  - .1 Maximum Flame Spread = 0.
  - .2 Smoke Developed = 0.
- .5 Moisture Sorption (ASTM C1104/C1104M): 0.04 percent.
- .6 Smoulder Resistance (CAN/ULC S129): 0.01 percent.

.4 Firestop Sealants: to CAN/ULC S115; ULC labelled; non-sagging type for vertical applications; types as listed in tested assemblies.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Confirm compatibility of surfaces to receive sealant materials.

.3 Verify surfaces of openings are sound, clean, dry and ready to receive application of sealant.

.4 Verify that penetration elements are securely fixed and properly located.

3.2 PREPARATION

.1 Protect adjacent surfaces and equipment from damage.

.2 Clean contact surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of sealant.

.3 Remove incompatible materials which affect bond by scraping, brushing, water or solvent cleaning, or sandblasting.

3.3 APPLICATION

.1 Install firestop insulation in compacted thicknesses required by ULC design. Compress insulation approximately 33 percent.

.2 Apply sealant in strict accordance with ULC certification.

.3 Coordinate and cooperate with adjacent, contiguous and related materials trades, such as concrete, masonry, gypsum board, plumbing, conduit, electrical wiring, communication systems, etc., to ensure a proper and timely installation.

.4 Seal holes and voids made by penetrating items to ensure an effective fire and smoke barrier.

.5 Seal intersections and penetrations of floors, ceilings, walls and columns.

.6 Seal around cutouts for lights, cabinets, pipes and plumbing, ducts, electrical boxes, etc.

.7 Wrap non-insulated heated pipes that may be subject to movement with a non-combustible smooth material to permit the pipe to move without damaging the firestopping and smoke seal.

.8 Maintain the integrity of any insulation and vapour retarders on insulated pipes and ducts at the fire separation.

.9 Where floor openings exceed 100 mm in width and may be subjected to traffic or loading, install cover plate systems capable of supporting same loading as floor.

3.4 FIELD QUALITY CONTROL

.1 Perform field testing and inspection as specified in Division 01.

.2 Conduct inspections to ASTM E2174.

.3 Examine finished penetrations to ensure proper installation before concealing or enclosing any areas of work.

.4 Keep areas of work accessible until inspection has been completed.

.5 Manufacturer's Field Service: inspect to verify and confirm that systems installation is in strict accordance with manufacturer's and ULC requirements.

.6 Correct unacceptable work and provide further inspection to verify compliance with requirements.

3.5 CLEANING

.1 Refer to Division 01.

.2 Immediately remove spots, smears, stains, residues, adhesives, etc., from installation, including from adjacent surfaces.

.3 Do not use Products containing volatile solvents.

.4 Leave the Work in a clean and satisfactory condition.

3.6 PROTECTION

.1 Refer to Division 01.

.2 Protect firestopping assemblies from damage until Owner occupancy.

.3 Make Good damaged firestopping assemblies.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 06 20 00 - Finish Carpentry.

.3 Section 06 40 00 - Architectural Woodwork.

.4 Section 06 61 16 - Solid Surfacing Fabrications.

.5 Section 07 84 00 - Firestopping.

.6 Section 08 12 13 - Hollow Metal Frames.

.7 Section 08 80 00 - Glazing.

.8 Section 09 21 16 - Gypsum Board Assemblies.

.9 Section 09 51 23 - Acoustical Tile Ceilings.

.10 Section 22 44 13 - Plumbing Fixtures Combined With Drawing Schedule.

1.2 REFERENCES

.1 ASTM C919-12: Standard Practice for Use of Sealants in Acoustical Applications.

.2 ASTM C920-14a: Standard Specification for Elastomeric Joint Sealants.

.3 ASTM C1193-16: Standard Guide for Use of Joint Sealants.

.4 CAN/CGSB-19.13-M87: Sealing Compound, One Component, Elastomeric, Chemical Curing.

.5 CAN/CGSB-19.17-M90: One Component Acrylic Emulsion Base Sealing Compound.

1.3 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: duplicate samples of each specified joint sealant, illustrating available colour selections.

1.4 MANUFACTURER REPORTS

.1 Submit manufacturers' reports as specified in Division 01.

.2 Manufacturers' Reports: Manufacturer field review reports, as specified below.

1.5 QUALIFICATIONS

.1 Applicator: a firm experienced in the application of joint sealants, and having a minimum of 3 years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products in manufacturer's sealed packages.

.3 Store Products in warm, dry conditions.

1.7 AMBIENT CONDITIONS

.1 Do not install solvent curing sealants in enclosed building spaces.

.2 Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.8 WARRANTY

.1 Submit extended warranties in accordance with the General Conditions of the Contract.

.2 System Warranty: 2 year extended warranty including coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Dow Corning.
.2 Tremco.

.2 Substitution Procedures: refer to Division 01.

2.2 PERFORMANCE CRITERIA

.1 Seal gaps between dissimilar Products and equipment, visible or otherwise, to protect building components from air infiltration and moisture penetration.

2.3 MATERIALS

.1 Glazing Sealant: one part, moisture curing, acetoxy silicone sealant; to CAN/CGSB-19.13-M, Type MG-2-25-A-L; Proglaze by Tremco, Clear colour.

.2 Mildew-Resistant Sealant for Washroom Areas: to ASTM C920, Type S, Grade NS, Class 25, Use NT; one-part, fungicidal silicone rubber; DC 786 by Dow Corning, Transparent colour.

.3 Acoustical and General Purpose Sealant: to CAN/CGSB-19.17-M; one-part, siliconized acrylic latex, mildew-resistant, accommodating joint movement of plus or minus 12-1/2 percent; Tremflex 834 by Tremco, Clear colour.

.4 Primer: non-staining type, recommended by sealant manufacturer to suit application.

.5 Joint Cleaner: non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

.6 Backer Rod: open cell polyethylene foam core wrapped in a closed cell polyethylene skin.

.7 Bond Breaker: pressure sensitive tape recommended by sealant manufacturer to suit application.

3 Execution

3.1 PREPARATION

.1 Clean and prime joints to requirements of manufacturer's instructions.

.2 Remove loose materials and foreign matter which might impair adhesion of sealant.

3.2 APPLICATION

.1 Install joint sealants to ASTM C1193.

.2 Install acoustical sealants to ASTM C919.

.3 Apply sealant with pressure gun having proper size nozzle and extrusion nozzle where required.

.4 Use sufficient pressure to fill joints solid to joint filler.

.5 Shape nozzle to finish sealant in a neat concave bead.

.6 Apply sealant sufficiently in from normal face of joints to form a positive shadow line.

.7 Tool sealant smooth and slightly concave, free from ridges, wrinkles, air pockets and embedded impurities.

.8 Ensure proper configuration and depth achieved. Depth of sealant at point of adhesion shall be not more than one-half the width.

3.3 FIELD QUALITY CONTROL

.1 Inspect completed sealant applications for adhesion failures, cohesion failures, holes, gaps, and areas where leaks could become present.

.2 Reject failed joints and joints filled with only a skin bead or insufficient volume of sealant.

.3 Remove material from rejected joints, clean and re-seal to attain proper width-to-depth joint coverage.

3.4 MANUFACTURER SERVICES

.1 Arrange for sealant manufacturer's representative to be present prior to commencement of sealant installation.

.2 Consult with manufacturer's representative as to joint conditions.

.3 Arrange for manufacturer's representative to regularly inspect the joint sealant application (minimum twice per week).

.4 Submit written field review reports, confirming the sealant installation is in strict accordance with manufacturer's recommendations.

3.5 CLEANING

.1 Refer to Division 01.

.2 Remove excess sealant and droppings using a cleaner which will not damage adjacent surfaces.

.3 Make Good surfaces that have become defaced or disfigured as a result of sealant application.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 07 92 00 - Joint Sealants.

.3 Section 08 14 00 - Wood Doors.

.4 Section 08 71 00 - Door Hardware.

.5 Section 08 80 00 - Glazing.

.6 Section 09 21 16 - Gypsum Board Assemblies.

.7 Section 09 90 00 - Painting and Coating.

1.2 REFERENCES

.1 ASTM A653/A653M-15e1: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 Canadian Steel Door Manufacturer's Association: Canadian Metric Conversion Guide for Steel Doors and Frames (Modular Construction).

.3 Canadian Steel Door Manufacturer's Association: Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

.4 Canadian Steel Door Manufacturer's Association: Recommended Dimensional Standard for Steel Doors and Frames.

.5 Canadian Steel Door Manufacturer's Association: Recommended Specifications for Commercial Steel Door and Frame Products.

.6 CSA W59-13: Welded Steel Construction (Metal Arc Welding).

.7 CAN/CGSB-1.40-97: Anticorrosive Structural Steel Alkyd Primer.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: manufacturer's standard data sheets illustrating standard frame construction.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate frame configuration, anchor types and spacings, location of cut outs for hardware, reinforcement, and finish.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Store Products to CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

1.6 WARRANTY

.1 Submit an extended warranty in accordance with the General Conditions of the Contract.

.2 Extended Warranty: for a period of 2 years, covering against twisting, buckling, weld failure and corrosion.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
- .1 All Steel Doors 2000 Limited.
- .2 Artek Door (1985) Limited.
- .3 Baron Metal Industries Inc.
- .4 Daybar Industries Limited.
- .5 Fleming Door Products Ltd.
- .6 Gensteel Doors.
- .7 Metal Door Limited.
- .8 Trillium Steel Doors Limited.
- .9 Vision Hollow Metal Limited.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Hollow Metal Frames: 1.60 mm nominal coated thickness, cold-rolled commercial quality steel; paintable galvanneal finish; sizes and configurations as indicated on Drawings.

.2 Infill Panels: 1.60 mm nominal coated thickness, cold-rolled commercial quality steel panels factory laminated to both sides of a 16 mm thick fire-rated gypsum board core; adequate to provide a 1 hour fire rating when required; paintable galvanneal finish.

.3 Reinforcements: cold-rolled commercial quality steel, regular galvanneal finish, nominal coated thicknesses as follows:
- .1 Flush Bolt, Lock and Strike Reinforcement: 1.60 mm
- .2 Hinge Reinforcements: 3.51 mm.
- .3 Door Closer and Holder Reinforcements: 2.74 mm.

.4 Anchors: cold-rolled commercial quality steel, regular galvanneal finish, nominal coated thicknesses as follows:
- .1 T-Strap Type: 1.30 mm.
- .2 Stirrup-strap Type: 50 x 250 mm size, 1.60 mm thick.
- .3 Jamb Floor Type: 1.60 mm thick.
- .4 Stud Type: 1.00 mm thick.

.5 Jamb Spreaders: 1.00 mm nominal coated thickness, cold-rolled commercial quality steel, regular galvanneal finish.

.6 Mortar Guard Boxes: 0.84 mm nominal coated thickness, cold-rolled commercial quality steel, regular galvanneal finish.

.7 Glazing Stops: rolled steel channel shape, butted corners; prepared for countersink style tamper-proof screws.

.8 Bumpers: resilient rubber.

.9 Bituminous Coating: fibrous asphalt emulsion.

.10 Touch-up Primer: rust-inhibitive touch-up primer, to CAN/CGSB-1.40.

.11 Joint Sealant: as specified in Section 07 92 00.

2.3 FABRICATION

.1 Fabricate frames as welded units.

.2 Conform to CSDMA Recommended Specifications for Commercial Steel Door and Frame Products.

.3 Fabricate frames with fixed mullions, to profiles shown, with hardware reinforcement plates welded in place.

.4 Welding: to CSA W59. Grind exposed welds smooth and flush. Fill open joints, seams, and depressions with filler or by continuous brazing or welding. Grind smooth to true sharp arrises and profiles. Sand to a smooth, true, uniform finish.

.5 Mitre corners of frames. Cut frame mitres accurately and weld continuously on inside of frame.

.6 Protect strike and hinge reinforcements and other openings with mortar guard boxes welded to frame.

.7 Reinforce frames wider than 1.2 metres with roll formed steel channels fitted tightly into frame head, flush with top.

.8 Fit frames with channel or angle spreaders, minimum two per frame, to ensure proper frame alignment. Install stiffener plates to spreaders between frame trim where required to prevent bending of trim and to maintain alignment when setting and during construction.

.9 Provide adjustable T-strap anchors in frames to be installed in masonry openings, spaced at 600 mm OC.

.10 Where frames are required to terminate at finished floor, Provide plates for anchorage to floor slab.

.11 Prepare interior door frames for single stud door silencers, as follows:
- .1 Single Door Frames: 3 on strike jamb.
- .2 Double Egress Door Frames: two on head for each door leaf.

.12 Fabricate frames and screens to accommodate scheduled glazing. Secure glazing stops to frames with counter sunk oval head sheet metal screws.

.13 Preparation for Hardware:
- .1 Prepare frames for heavy weight oversize butt hinges, cylindrical locksets, rim and concealed vertical rod / mortise lock case exit devices, magnetic locks, surface door closers and concealed overhead stops.
- .2 Conform to approved finish hardware schedule.
- .3 Blank, mortise, reinforce, drill and tap frames to receive templated hardware, as required. Coordinate with Section 08 71 00.

2.4 FINISHES

.1 Paintable Galvanneal Coating: wiped zinc-iron coating, with streak-free matte grey appearance, to ASTM A653/A653M, ZF120 coating designation.

.2 Regular Galvanneal Coating: wiped zinc-iron coating, with streak-free matte grey appearance, to ASTM A653/A653M, ZF75 coating designation.

3 Execution

3.1 INSTALLATION

.1 Install Products to CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

.2 Install Products plumb, square, aligned, without twist and at correct elevation.

.3 Coordinate with masonry and wallboard construction for anchor placement.

.4 Fill frames set in masonry walls and partitions solid with non-shrink grout or mortar, as specified in Section 04 00 00.

.5 Seal gaps between frames and walls with joint sealant, as specified in Section 07 92 00.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 20 00 - Finish Carpentry.

.2 Section 08 12 13 - Hollow Metal Frames.

.3 Section 08 71 00 - Door Hardware.

.4 Section 08 80 00 - Glazing.

.5 Section 09 90 00 - Painting and Coating.

1.2 REFERENCES

.1 ANSI/DHI A115.IG-1994: Installation Guide for Doors and Hardware.

.2 ANSI/WDMA I.S. 1A-13: Industry Standard for Interior Architectural Wood Flush Doors.

.3 ANSI A208.1-2009: Particleboard.

.4 Architectural Woodwork Manufacturers Association of Canada (AWMAC): Architectural Woodwork Standards, Edition 2-2014.

.5 ASTM E90-09: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.6 CAN/CGSB-11.3-M87: Hardboard.

.7 CSA O141-05 (R2009): Softwood Lumber.

.8 NFPA 80-2007: Fire Doors and Other Opening Protectives.

.9 CAN/ULC S104-10: Standard Method for Fire Tests of Door Assemblies.

.10 Underwriters Laboratories of Canada: List of Equipment and Materials.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate door elevations, stile and rail reinforcement, cutouts, and internal blocking for hardware attachment.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Pile doors flat on level supports to prevent warping.

.3 Protect face of first door unit by placing plywood or cardboard between supports and door. Cover the top door unit in a similar manner.

.4 Store doors in a dry, well-ventilated area.

.5 Seal top and bottom edges of wood doors stored for an extensive period of time.

1.5 WARRANTY

.1 Submit an extended warranty in accordance with the General Conditions of the Contract.

.2 Extended Warranty: for a period of three years, covering against warping beyond installation tolerances, and delamination or degradation of door faces.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
- .1 Baillargeon.
- .2 Door-Lam.
- .3 Jeld-Wen, Inc.
- .4 Lambton Door.
- .5 Marshfield Door Systems.
- .6 Masonite.

.2 Substitution Procedures: refer to Division 01.

2.2 REGULATORY REQUIREMENTS

.1 Fire Rated Door Assemblies: permanently labelled to National Fire Protection Association standards for fire rated class indicated, as tested to CAN/ULC S104.

2.3 MATERIALS

.1 Solid Core Flush Wood Doors - Fire Rated: to ANSI/WDMA I.S. 1A, Extra Heavy Duty, 44 mm thick; 45-minute rating as scheduled; 3-ply construction, as follows:
- .1 Perimeter Construction: solid lumber lock blocks, vertical stiles and top and bottom rails, bonded to core material.
- .2 Core: homogeneous incombustible mineral core; ULC labelled.
- .3 Face Assembly Adhesive: Type I - Waterproof.
- .4 Core Assembly Adhesive: Type II - Water-resistant.
- .5 Edges: to AWMAC Architectural Woodwork Standards, Type D - Solid Wood.
- .6 Door Faces: 3 mm thick hardboard, to CAN/CGSB-11.3-M, Type 2 - Tempered; Smooth; primed finish.

.2 Solid Core Flush Wood Doors - Non-Rated: to ANSI/WDMA I.S. 1A, Extra Heavy Duty, 44 mm thick; 3-ply construction, as follows:
- .1 Perimeter Construction: solid lumber lock blocks, vertical stiles and top and bottom rails, bonded to core material.
- .2 Core: AWMAC Particleboard Core Type; 448 kg/m^3 solid particleboard core to ANSI A208.1.
- .3 Face Assembly Adhesive: Type I - Waterproof.
- .4 Core Assembly Adhesive: Type II - Water-resistant.
- .5 Glass Stop: matching wood, flat bead type.
- .6 Edges: to AWMAC Architectural Woodwork Standards, Type D - Solid Wood.
- .7 Door Faces: 3 mm thick hardboard, to CAN/CGSB-11.3-M, Type 2 - Tempered; Smooth; primed finish.

2.4 FABRICATION

.1 Fabricate doors to AWMAC Architectural Woodwork Standards, Custom Grade.

.2 Provide and prepare sufficient amount of blocking in door edges to accommodate installation of scheduled door hardware.

.3 Provide fire-rated doors with sufficient wood blocking to fasten necessary hardware.

.4 Machine cut relief for hinges and closures and coring for handsets and cylinders.

.5 Prepare doors for heavy weight oversize butt hinges, cylindrical locksets, rim and concealed vertical rod / mortise lock case exit devices, magnetic locks, surface door closers and concealed overhead stops. Coordinate with Section 08 71 00.

.6 Provide and prepare openings for glazing.

3 Execution

3.1 INSTALLATION

.1 Install doors to ANSI/DHI A115.IG.

.2 Trim door width to a maximum of 5 mm.

.3 Trim door height by cutting equally on top and bottom edges to a maximum of 19 mm.

.4 Prepare doors to receive finish hardware to AWMAC Architectural Woodwork Standards.

3.2 TOLERANCES

.1 Maximum Diagonal Distortion: 1.5 mm measured with straight edge, corner to corner.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 08 12 13 - Hollow Metal Frames.

.2 Section 08 14 00 - Wood Doors.

.3 Section 26 01 16 - Electrical General Requirements.

1.2 ALLOWANCES

.1 The Contract Price includes a stipulated sum cash Allowance as specified in Section 01 21 01.

.2 Cash Allowance: includes the supply only of door hardware.

.3 Enter into a Subcontract agreement with the Owner's preferred hardware Supplier, for a stipulated price Subcontract in an amount equal to the cash allowance amount.

1.3 REFERENCES

.1 ANSI/DHI A115.IG-1994: Installation Guide for Doors and Hardware.

.2 Door and Hardware Institute (DHI) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.

.3 Door and Hardware Institute (DHI) - Sequence and Format for the Hardware Schedule.

.4 Door and Hardware Institute (DHI) - Keying Systems and Nomenclature.

.5 Door and Hardware Institute (DHI) - Abbreviations and Symbols.

.6 Canadian Steel Door Manufacturer's Association: Recommended Dimensional Standard for Steel Doors and Frames.

.7 Canadian Steel Door Manufacturer's Association: Canadian Metric Conversion Guide for Steel Doors and Frames (Modular Construction).

.8 University of Guelph Design Standard RD-03: Hardware.

1.4 PREINSTALLATION MEETINGS

.1 Refer to Division 01.

.2 Prior to installation of hardware, arrange a meeting between Owner, Contractor, Consultant, manufacturer, hardware Supplier, Architectural Hardware Consultant, and installer to review materials, procedures and coordinate related work.

1.5 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: data sheets illustrating each specified piece of finish hardware.

.3 Submit templates to installer prior to installation.

1.6 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: including finish hardware schedule, keying schedule, and wiring diagrams, as follows:
  .1 Finish Hardware Schedule, prepared by Architectural Hardware Consultant (AHC), in vertical format, to DHI Sequence and Format for the Hardware Schedule.
  .2 Keying Schedule: prepared by Architectural Hardware Consultant (AHC), to DHI Keying Systems and Nomenclature, including all special keying notes and stamping instructions. Do not order locks and cylinders until the key schedule has been accepted by the Consultant.
  .3 Wiring Diagrams: a written description of the functional use of all electrical hardware. Include door and frame elevations showing the location of each item of electrical hardware to be installed, including a diagram showing number and size of all conductors.

1.7 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Division 01.

.2 Operating and Maintenance Data: including maintenance instructions for each hardware item, catalogue cut sheets and Product data sheets for each Product, parts list for each Product, an updated copy of the finish hardware schedule illustrating actual Products installed, and a copy of the final keying schedule.

1.8 QUALIFICATIONS

.1 Hardware Supplier: a firm specializing in the supply of institutional door hardware, and having a minimum of 10 years documented experience.

.2 Hardware Supplier Personnel: employ a qualified Architectural Hardware Consultant (AHC) to supervise the supply of door hardware.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Package hardware separately for each opening in a package which contains all the hardware for that opening and is designated with applicable heading number, door number, and key-set symbol.

.3 Store Products in a clean, dry and secure area, on adequate shelving to permit organization so item numbers are readily visible.

.4 Supply Products complete with keys, templates and installation instructions, together with all required screws, expansion shields, anchors, jigs and other related accessories for satisfactory attachment and installation of hardware.

1.10 WARRANTY

.1 Submit manufacturers' standard extended warranties for each item of hardware.

2 Products

2.1 DESCRIPTION

.1 Ensure door hardware is of high institutional quality, as described in U-of-G Design Standard RD-03.

2.2 KEYING

.1 Conform to U-of-G Design Standard RD-03.

.2 Key doors to Owner’s existing GMK or MK system, to be determined by Owner's lock shop at time of Shop Drawing review.

.3 Provide visual key control (VKC) on the face of each cylinder and on change keys.

2.3 FINISHES

.1 Provide hardware with finishes described in U-of-G Design Standard RD-03.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify that door and frame components are ready to receive work and dimensions are as indicated on the shop drawings and schedules.

.3 Verify that power supply of 120 volts, 20 ampere, three phase, 60 Hertz is available to power operated devices.

3.2 INSTALLATION

.1 Install hardware to ANSI/DHI A115.IG.

.2 Use templates provided by hardware manufacturer.

.3 Provide routing or mortising for hinges and other items required to be mortised or rebated or otherwise housed within material.

.4 Install hardware at mounting heights specified in the manufacturers' templates or as indicated in hardware schedule.

.5 Install hardware using only manufacturer-supplied and -approved fasteners. Provide suitable security-type fasteners as specified in the hardware sets.

.6 Ensure locksets, latchsets and deadbolts are of the correct hand before installation to ensure that the cylinder is in the correct position. Handing is part of installation procedure.

.7 Ensure exit devices are of the correct hand and adjust device cam for proper outside trim function prior to installation. Handing is part of installation procedure.

.8 Install head seal prior to installation of “PA”-parallel arm mounted door closers and push side mounted door stops and holders.

.9 Counter sink through-bolt of door pull under push plate during installation.

.10 Mount closers, automatic operators and hold-open devices with through bolts, as indicated in the finish hardware schedule. Install closers and exit devices on wood doors with through-bolt style fasteners.

.11 Secure thresholds with machine screws and anchors.

3.3 FIELD QUALITY CONTROL

.1 Examine hardware after it has been installed and notify Consultant of improper installations, defective Products or where it does not conform to the Contract Documents.

3.4 ADJUSTING

.1 Replace Products exhibiting scratched or damaged surfaces.

.2 Properly tighten fasteners and ensure that fasteners are installed to the full required complement.

.3 Adjustment is inclusive of spring power, closing speed, latching speed and back-check at the time of installation.

.4 Adjust delayed-action door operators and closers to forty-second delay to accommodate barrier-free access. Time period to be approved by Owner.

3.5 DEMONSTRATION

.1 Refer to Division 01.

.2 Demonstrate operation and maintenance of hardware items, including proper use, servicing, adjusting and lubrication procedures.

3.6 PROTECTION

.1 Refer to Division 01.

.2 Cover surfaces with removable protective film.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealants.

.2 Section 08 12 13 - Hollow Metal Frames.

.3 Section 08 14 00 - Wood Doors.

.4 Section 10 28 13 - Toilet Accessories.

1.2 REFERENCES

.1 CAN/CGSB-12.1-M90: Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.5-M86: Mirrors, Silvered.

.3 Glass Association of North America (GANA): Glazing Manual.

.4 Glass Association of North America (GANA): Laminated Glazing Reference Manual.

.5 Glass Association of North America (GANA): GIB 01-0300 - Proper Procedures for Cleaning Architectural Glass.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: illustrating structural, physical and environmental characteristics, thickness and size limitations, special handling and installation requirements.

1.4 QUALITY ASSURANCE

.1 Conform to glazing installation methods and quality standards specified in GANA Glazing Manual and GANA Laminated Glazing Reference Manual.

.2 Select glazing compounds and sealants in accordance with glass manufacturers' instructions.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 AFG Glass Inc.
.2 AGC Glass Company North America.
.3 Guardian Industries Corp.
.4 Libbey-Owens Ford.
.5 PPG Industries, Inc.
.6 Pilkington Glass North America, Inc.
.7 Prelco.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Tempered Safety Glass: to CAN/CGSB-12.1-M; clear float glass fully tempered horizontally to achieve a net strength of not less than 4 to 5 times greater than regular annealed glass; 6 mm thick unless noted otherwise.

.2 Mirrored Glass: to CAN/CGSB-12.5-M; Type 18 float glass with polished edges; sizes as scheduled or noted on Drawings; 6 mm thick unless noted otherwise.

.3 Laminated Glass: to CAN/CGSB-12.1-M; two layers of 6 mm thick tempered safety glass laminated to a 0.76 mm thick vinyl interlayer to form a single, unified construction.

2.3 ACCESSORIES

.1 Glazing Sealant: as specified in Section 07 92 00.

.2 Setting Blocks: neoprene, 80-90 Shore A durometer hardness.

.3 Spacer Shims: neoprene, 50-60 Shore A durometer hardness.

.4 Glazing Tape: preformed butyl compound with integral resilient tube spacing device.

.5 Glazing Splines: resilient polyvinyl chloride extruded shape; Black colour.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify that openings for glazing are correctly sized, within tolerance and clean.

3.2 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION - DRY GLAZING METHOD

.1 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.2 Place setting blocks at one-third points with edge block no more than 150 mm from corners.

.3 Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

.4 Place glazing tape on free perimeter of glazing in same manner described above.

.5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.6 Knife trim protruding tape.

3.4 CLEANING

.1 Refer to Division 01.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels after Work is complete.

.4 Clean glass to GANA GIB 01-0300.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 07 92 00 - Joint Sealants.

1.2 REFERENCES

.1 AAMA CW-10-12: Care and Handling of Architectural Aluminum from Shop to Site.

.2 AAMA 2603-02: Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.3 AMCA 500-L-07: Laboratory Methods of Testing Louvers for Rating.

.4 AMCA 501-03: Application Manual for Air Louvers.

.5 AMCA 511-07: Certified Ratings Program - Product Rating Manual for Air Control Devices.

.6 ASTM A123/A123M-15: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.7 ASTM A153/A153M-16: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.8 ASTM B209M-14: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).

.9 ASTM B221M-13: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: indicating material types and thicknesses, and air flow and water entrainment performance test results.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: indicate elevations, sections and specific details for each louvre, including anchorage details, connection details for component parts, material finishes, and structural calculations signed and sealed by the fabricator's design engineer.

1.5 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: duplicate 50 x 50 mm size samples, illustrating full range of colour and finish selections.

1.6 TEST AND EVALUATION REPORTS

.1 Submit test reports as specified in Division 01.

.2 Test Reports: manufacturer's standard test results indicating Products meet the specified performance criteria, as prepared by an independent testing agency, and current within the past 5 years.

1.7 QUALIFICATIONS

.1 Fabricator's Design Engineer: a professional engineer, experienced in air movement and control design and licensed in the Place of the Work.

.2 Fabricator and Installer: a firm specializing in the fabrication and installation of wall intake and exhaust louvers, and having a minimum of 5 years documented experience.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Conform to AAMA CW-10.

.3 Deliver Products to the Place of the Work in clearly labelled protective cartons or wrappings.

.4 Store Products sufficiently off the ground and covered with weatherproof, flame-resistant sheeting.

.5 Handle Products in a manner to prevent racking.

.6 Hoist Products from jambs only.

.7 Do not use heads, sills or blades to lift or transport Products.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 C/S Group.

.2 Substitution Procedures: refer to Division 01.

2.2 DESIGN CRITERIA

.1 Design Products to withstand wind and snow loads in accordance with local code requirements.

.2 Allowable Deflection for Structural Members: maximum L/180 or 19 mm, whichever is less.

.3 Allowable Deflection for Blades: maximum L/120 or 13 mm across the weak axis, whichever is less.

.4 Design louvers to have an average free area of 50 percent when tested to AMCA 500-L.

.5 Design louver to have the following properties when tested to AMCA 501:
.1 Free Area Velocity at Point of Beginning Water Penetration: 5.70 metres per second.
.2 Maximum Recommended Air Intake Velocity: 4.69 metres per second.
.3 Intake Pressure Drop: 32.3 Pa.
.4 Maximum Recommended Air Exhaust Velocity: 8.89 metres per second.
.5 Exhaust Pressure Drop: 116.7 Pa.

2.3 MATERIALS

.1 Extruded Aluminum: to ASTM B221M, 6063-T5 alloy.

.2 Sheet Aluminum: to ASTM B209M, 3003-H14 alloy.

.3 Sheet Steel: 1.2 mm thick, cold-rolled commercial quality steel.

.4 Fasteners: stainless steel, prefinished to match louvre frame.

.5 Joint Sealant: as specified in Section 07 92 00.

2.4 MANUFACTURED UNITS

.1 Louvered Vents: dual draining type, fabricated as follows:
- .1 Frame: 1.42 mm thick extruded aluminum, 50 x 100 mm size, flanged L- or A-frame as required by framing conditions; shop-painted finish.
- .2 Blades: 1.63 mm thick extruded aluminum, 30 degree configuration, shop-painted finish.
- .3 Bird Screen: 1.27 mm OD aluminum wire, interwoven to 16 x 16 mm open weave, square pattern, set in 1.4 mm thick extruded aluminum frame, mill finish.
- .4 Sill and Flashing: 1.27 mm thick sheet aluminum, roll formed to required shape, single length in one piece per location; shop-painted finish.
- .5 Insulated Infill Panel: 1.2 mm thick prefinished sheet aluminum face, semi-rigid mineral fibre insulation to thicknesses indicated, and a 1.2 mm thick galvanized steel rear panel, sealed at all edges.
- .6 Finish: shop-applied pigmented coating.
- .7 Sizes: as indicated on Drawings.
- .8 Manufacturer Name and Product: Model A4157 by C/S Group.

2.5 FABRICATION

.1 Fabricate Products free from distortion and effects detrimental to appearance and performance.

.2 Fasten louver frames and blades with stainless steel screws or heliarc welding.

.3 Neatly mitre louver frames at corners and reinforce with corner brackets.

2.6 FINISHES

.1 Liquid-Applied Coating on Aluminum: to AAMA 2603, one-coat acrylic resin liquid extrusion and coil coating, applied to minimum 0.02 mm dry film thickness; Duracron by PPG Industries, Inc., colour as selected by Consultant.

.2 Galvanized Coating on Steel Components: hot dipped, zinc alloy coating, to ASTM A123/A123M, Z275 coating designation.

.3 Galvanized Coating on Steel Hardware: hot dipped, zinc alloy coating, to ASTM A153/A153M, Class B2.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify dimensions of supporting structure at the Place of the Work.

3.2 INSTALLATION

.1 Securely install Products square, plumb and level, with uniform joints.

.2 Install louvers to AMCA 501.

.3 Cut and trim components during erection only with the approval of the manufacturer. Make Good damaged finishes.

.4 Remove and replace members where site-cutting or trimming has impaired the strength or appearance of the assembly.

.5 Flash exterior louvers, vents and grilles to prevent water infiltration into building enclosure.

.6 Seal around frames to ensure weathertight joint. Conform to Section 07 92 00.

3.3 TOLERANCES

.1 Maximum Variation From Plane: plus or minus 3 mm per 3.66 metres of length, but not exceeding 13 mm in any total building length.

.2 Maximum Offset From True Alignment Between Two Members: plus or minus 1.5 mm, under both loaded and non-loaded conditions.

3.4 ADJUSTING

.1 Field touch-up scratches or damaged enamel finishes.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 07 92 00 - Joint Sealants.

.3 Section 08 12 13 - Hollow Metal Frames.

.4 Section 09 51 23 - Acoustical Tile Ceilings.

.5 Section 09 81 00 - Acoustic Insulation.

.6 Section 09 84 13 - Fixed Sound-Absorptive Panels.

.7 Section 09 90 00 - Painting and Coating.

1.2 REFERENCES

.1 ASTM A641/A641M-09a(2014): Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

.2 ASTM A653/A653M-15e1: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM A792/A792M-10(2015): Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.4 ASTM C475/C475M-15: Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.5 ASTM C514-04(2014): Standard Specification for Nails for the Application of Gypsum Board.

.6 ASTM C645-14e1: Standard Specification for Nonstructural Steel Framing Members.

.7 ASTM C754-15: Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.8 ASTM C840-13: Standard Specification for Application and Finishing of Gypsum Board.

.9 ASTM C954-15: 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.

.10 ASTM C1002-14: 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.

.11 ASTM C1047-14a: Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.12 ASTM C1178/C1178M-13: Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.

.13 ASTM C1264-14a: Standard Specification for Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling, and Storage of Gypsum Panel Products.

.14 ASTM C1396/C1396M-14a: Standard Specification for Gypsum Board.

.15 ASTM C1629/C1629M-15: Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

.16 ASTM C1658/C1658M-13: Standard Specification for Glass Mat Gypsum Panels.

.17 ASTM E90-09: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.18 CGC Inc.: CGC Gypsum Construction Handbook.

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

.20 CAN/ULC S101-07: Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.21 Ceiling & Interior Systems Construction Association (CISCA): Ceiling Systems Handbook.

.22 Gypsum Association GA-214-10: Recommended Levels of Gypsum Board Finish.

.23 Underwriters Laboratories of Canada: List of Equipment and Materials.

1.3 QUALIFICATIONS

.1 Installers: a firm specializing in the installation of metal-framed gypsum board assemblies, having a minimum of 5 years documented experience, and a member in good standing of the Interior Systems Contractors Association of Ontario (ISCA).

1.4 DELIVERY, STORAGE AND HANDLING

.1 Conform to ASTM C1264.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers of metal framing having Product considered acceptable for use:
.1 Bailey Metal Products Limited.
.2 CGC Inc.
.3 Dietrich Metal Framing.

.2 Manufacturers of gypsum board having Product considered acceptable for use:
.1 CGC Inc.

.3 Manufacturers of coated glass-mat faced tile backer board having Product considered acceptable for use:
.1 G-P Gypsum Corporation.

.4 Substitution Procedures: refer to Division 01.

2.2 DESCRIPTION

.1 Interior Partitions: vertical non-load bearing metal stud framing clad with wall boards mechanically-fastened or adhered on one or both sides, and including acoustical insulation and accessories where indicated.

.2 Suspended Ceilings: horizontal non-load bearing channels and framing carrying mechanically-fastened ceiling boards, and including acoustical ceiling hangers, insulation and accessories where indicated.

.3 A non-load bearing (non-structural) member is defined as a member in a steel-framed system which is limited to transverse (out-of-plane) load of not more than 480 Pa, a superimposed axial load, exclusive of sheathing materials, of not more than 1460 N/m, or a superimposed axial load of not more than 890 N.

.4 A load bearing (structural) stud may be used in a non-load bearing application; however, non-load bearing members (studs or track) may never be used in a load bearing (axial or lateral loading) application.

2.3 PERFORMANCE CRITERIA

.1 Provide metal wall framing systems with a maximum design limit of 240 Pa and a maximum allowable deflection of L/360.

.2 Provide metal ceiling framing systems with a maximum allowable deflection of L/240.

.3 Fire-Resistance Rated Assemblies: Provide Products and construction identical to those tested in the listed assemblies; to CAN/ULC S101.

.4 Sound Rated Assemblies: Provide Products and construction identical to those tested in the listed assemblies; to ASTM E90.

2.4 METAL FRAMING

.1 Metal Studs and Tracks: to ASTM C645, Heavy Duty; 0.836 mm thick sheet steel; galvanized or galvalumed finish; C-Shape with minimum 32 mm flange width, complete with serrated faces and knock-outs for electrical fitments; depths as indicated on Drawings.

.2 Metal Shaft Wall Studs: to ASTM C645, Heavy Duty; minimum 0.836 mm thick sheet steel; galvanized or galvalumed finish; CH- and E-Shapes, complete with serrated faces and knock-outs for electrical fitments; depths as indicated on Drawings.

.3 Metal Deflection Track: to ASTM C645, minimum 0.455 mm thick sheet steel; galvanized or galvalumed finish; U-Shape with long legs, designed to accommodate structural deflections; depths as indicated on Drawings.

.4 Furring Members: to ASTM C645, minimum 0.455 mm thick sheet steel; galvanized or galvalumed finish; and as described below:
  .1 C-Shaped Furring Channels: minimum 13 mm wide flange, 19 mm deep unless noted otherwise on Drawings.
  .2 Hat-Shaped Furring Channels: minimum 13 mm wide flange, 22 mm deep unless noted otherwise on Drawings.
  .3 Z-Shaped Furring: with slotted or non-slotted web, 32 mm face flange, 22 mm wall attachment flange; depth as indicated on Drawings.
  .4 Resilient Furring Channels: designed to reduce sound transmission; 13 mm deep unless noted otherwise on Drawings.

.5 Carrying Channels: to ASTM C754, minimum 1.37 mm thick cold-formed steel with galvanized or galvalumed finish; having minimum yield strength of 228 MPa; C-Shape with minimum 13 mm flange width, 38 mm deep unless noted otherwise on Drawings.

.6 Furring Brackets: 0.79 mm thick sheet steel; galvanized or galvalumed finish; adjustable, with corrugated-edge.

.7 Flat Strap and Backing Plates: 0.455 mm thick sheet steel; galvanized or galvalumed finish; lengths and widths as indicated on Drawings.

.8 Channel Bridging: minimum 0.455 mm thick sheet steel; galvanized or galvalumed finish; minimum 13 mm wide flange, 19 mm deep unless noted otherwise on Drawings.

.9 Hanger Wire: to ASTM A641/A641M, zinc-coated, soft-annealed, 3.77 mm OD steel wire.

.10 Tie Wire: to ASTM A641/A641M, zinc-coated, soft-annealed, 1.21 mm OD steel wire.

2.5 BOARDS

.1 Gypsum Board - Abuse-Resistant (GB-AR): to ASTM C1629/C1629M, Type X; Level II - Mild to Moderate Duty; 15.9 mm thick gypsum abuse-resistant panel with water- and mould-resistant gypsum core and paper facers, tapered long edges and square ends; Sheetrock Brand Panels Mold Tough AR FireCode X by CGC Inc.

.2 Gypsum Board - Fire-Rated (GB-FR): to ASTM C1396/C1396M, Type C; fire-rated gypsum panel with water- and mould-resistant gypsum core and paper facers, tapered edges, ULC labelled; thicknesses as indicated on Drawings; Sheetrock Brand Mold Tough Panels FireCode C by CGC Inc.

.3 Gypsum Board - Shaft Liner (GB-SL): to ASTM C1658/C1658M, Type X; 25 mm thick; double bevelled edges; silicone treated gypsum core, with coated glass mat facers both sides; Sheetrock Brand Glass-Mat Liner Panels by CGC Inc.

.4 Gypsum Board - Backing Board (GB-BB): to ASTM C1396/C1396M; 12.7 mm thick; paper-faced; square edges.

.5 Gypsum Board - Tile Backer (GB-TB): to ASTM C1178/C1178M; 12.7 mm thick coated glass mat-faced gypsum panel, with silicone-treated gypsum core, glass fiber mesh facers both sides, and a co-polymer waterproof coating on tile-face side, square edges; Dens-Shield Tile Backer by G-P Gypsum Corporation.

2.6 ACCESSORIES

.1 Corner Beads, Casing Beads, Control Joints and Edge Trim: to ASTM C1047; metal type.

.2 Reveals and Trim Reglets: to ASTM C1047; extruded aluminum profiles; as indicated on Drawings.

.3 Nail Fasteners: galvanized steel; to ASTM C514.

.4 Steel Drill Screws: galvanized steel; to ASTM C954.

.5 Self-Tapping Screws: galvanized steel, to ASTM C1002, Types as follows:
.1 For Securement to Metal Framing: fine thread, Type S.
.2 For Securement to Gypsum Backing Board: coarse-pitch high-thread, Type G.

.6 Adhesive: to CAN/CGSB-71.25-M.

.7 Joint and Skim Coat Materials: to ASTM C475/C475M; reinforcing tape and joint compounds as recommended by manufacturer.

.8 Acoustic Insulation: mineral fibre acoustical batt insulation, as specified in Section 09 81 00.

.9 Sealant: acoustical sealant, as specified in Section 07 92 00.

.10 Water: potable.

2.7 MIXING

.1 Thoroughly mix joint and skim coat materials to a homogenous mixture, of trowel able consistency.

2.8 FINISHES

.1 Galvanized Coating on Metal Framing Components: hot dipped zinc coating, to ASTM A653/A653M, Z120 coating designation.

.2 Galvalumed Coating on Metal Framing Components: aluminum-zinc alloy coating, to ASTM A792/A792M, AZM150 coating designation.

3 Execution

3.1 PREPARATION

.1 Suspended Assemblies: coordinate installation of suspension systems with installation of overhead structure.
  .1 Ensure inserts and other provisions for anchorages to building structure have been installed to receive hangers at the required spacing.
  .2 Supply concrete inserts and other devices to other related Sections for installation in advance.

.2 Before sprayed fireproofing is applied, attach offset anchor plates or ceiling track to surfaces designated to receive sprayed fireproofing. Where offset anchor plates are required, Provide continuous plates fastened to building structure at maximum 600 mm OC.

.3 Once sprayed fireproofing has been applied, remove them only to the extent necessary for installation of non-load bearing steel framing. Do not reduce thickness for sprayed fireproofing below that required for fire-resistance ratings indicated. Protect adjacent sprayed fireproofing from damage.

3.2 METAL WALL FRAMING

.1 Install metal wall framing to ASTM C754 and the CGC Gypsum Construction Handbook.

.2 Where metal framing is installed directly against exterior masonry walls or dissimilar metals at exterior walls, Provide a foam gasket between the metal framing and exterior wall.

.3 Install studs such that flanges within the framing system point in same direction.

.4 Space metal studs at maximum 400 mm OC.

.5 Install track floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions of structure.

.6 Where framing extends to overhead structural supports, Provide deflection track to create a slip-type head joints to produce joints at tops of framing system that prevent axial loading of finished assemblies due to deflection of structure.

.7 Screw vertical studs at door opening jambs to jamb anchor clips at door frames. Install track section for cripple studs at head and secure to jamb studs.
  .1 Provide two studs at each jamb.
  .2 Provide cripple studs at head adjacent to each jamb stud, with a minimum 13 mm clearance from jamb stud to allow for installation of control joint in finished assembly.

.8 Provide framing below sills of openings to match framing required above opening heads.

.9 Fire-Resistance-Rated Partitions: install framing to comply with fire-resistance-rated assembly indicated. Support closures and make partitions continuous from floor to underside of solid structure.

.10 Sound-Rated Partitions: install framing to comply with sound-rated assembly indicated.

.11 Curved Partitions: Bend track to uniform curve and locate straight lengths so they are tangent to arcs. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of not less than two studs at ends of arcs, place studs at 150 mm OC.

.12 Direct Furring: attach furring to concrete or masonry with stub nails, screws designed for masonry attachment, or power-driven fasteners spaced at 610 mm OC.

.13 Z-Furring Members:
- .1 Erect insulation vertically and hold in place with Z-furring members spaced at 610 mm OC.
- .2 Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or power-driven fasteners spaced at 610 mm OC.
- .3 At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel.
- .4 At interior corners, space second member no more than 305 mm from corner and butt insulation to fit.

.14 Unless indicated otherwise, Provide supplementary framing and furring to conceal pipes, conduit and ducts.

.15 Provide supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings and similar construction.

.16 Install bracing at terminations in assemblies.

.17 Do not bridge building control joints and expansion joints with non-load bearing steel framing members. Frame both sides of joints independently.

.18 Installation Tolerances: install framing members so fastening surfaces vary not more than 3 mm from the plane formed by the faces of adjacent framing members.

3.3 SUSPENDED CEILING FRAMING

.1 Install ceiling framing to ASTM C754 and CISCA installation standards.

.2 Isolate suspension system from building structure. Prevent transfer of loading imposed by structural movement.

.3 Install hangers plumb and free from contact with insulation or other objects within the ceiling plenum.

.4 Size supplemental suspension members and hangers to support ceiling loads within established performance limits.

.5 Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or similar devices.

.6 Secure wire hangers by looping and wire tying, either directly to structure or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate; and in a manner that will not cause hangers to fail or deteriorate.

.7 Do not attach hangers to steel roof decking, or to rolled-in hanger tabs of composite steel floor decking.

.8 Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

.9 Do not connect or suspend steel framing from ducts, pipes or conduit.

.10 For fire-resistance-rated assemblies, wire tie furring channels to supports.

.11 Installation Tolerances: level to within 3 mm in 3.6 metres, measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.4 ACOUSTICAL ACCESSORIES

.1 Install resilient channels at maximum 600 mm OC.

.2 Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

.3 Install acoustical sealant within designated sound-rated partitions.

3.5 BOARD INSTALLATION

.1 Install boards to ASTM C840 and the CGC Gypsum Construction Handbook.

.2 Glue and screw boards to metal furring or framing.

.3 Install overhead suspended gypsum board perpendicular to supports.

.4 Install shaft liner gypsum board on metal shaft wall stud and track framing.

.5 Double Layer Applications: Use gypsum backing board for first layer, place perpendicular to framing or furring members. Place second layer perpendicular to first layer.

.6 Place corner beads at external corners. Place edge trim where gypsum board abuts dissimilar materials. Fasten with nail attachment, unless specified otherwise.

.7 Provide bulkheads where changes of ceiling or height occur.

.8 Install access panels when and where directed by affected facility service Subcontractors.

3.6 BOARD FINISHING

.1 Tape, fill, and sand exposed joints, edges, and corners to a smooth surface.

.2 Leave surfaces smooth, even, plumb and true, ready to receive final finishes specified in other Sections.

.3 Unless specified otherwise, Provide Level 5 finish to GA-214.
.1 Provide Level 1 finish on concealed surfaces, such as in plenum spaces above ceilings.
.2 Provide Level 2 finish on surfaces designated to receive tile finishes.
.3 Provide Level 4 finish on ceiling surfaces and other surfaces designated to receive a flat painted finish.

3.7 CONTROL JOINTS

.1 Provide control joints where indicated on Drawings, and where:
.1 ceiling, partition or furring abuts a structural element,
.2 ceiling, partition or furring abuts dissimilar construction,
.3 construction changes within plane of the partition or ceiling,
.4 partition or furring run exceeds 9.0 metres,
.5 ceiling dimensions exceed 15.0 metres in either direction,
.6 wings of "L-", "U-" and "T"-shaped ceiling areas are joined, and
.7 expansion or control joints occur in the structural elements of the building.

.2 Break continuity of gypsum board and framing system at control joints.

.3 Provide continuous control joint profile.

3.8 RELIEF JOINTS

.1 Provide relief joints where indicated on the Drawings and where gypsum board assemblies abut dissimilar construction.

.2 Stop gypsum board 6 mm from abutting construction at dissimilar building elements, unless indicated otherwise.

.3 Provide a thermal break where gypsum board comes into contact with frames. Adhere self-adhering tape to casing bead and compress during installation of gypsum board.

.4 Provide reveal mouldings where gypsum board ceilings meet curved wall surfaces, and where indicated on the Drawings.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 09 21 16 - Gypsum Board Assemblies.

.3 Section 09 68 13 - Tile Carpeting.

1.2 REFERENCES

.1 ANSI A108.01-2012: General Requirements: Subsurfaces and Preparations by Other Trades.

.2 ANSI A108.4-2012: Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive.

.3 ANSI A108.5-2012: Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.

.4 ANSI A108.6-2012: Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy.

.5 ANSI A108.13-2012: Installation of Load Bearing, Bonded, Waterproof Membrane for Thin-Set Ceramic Tile and Dimension Stone.

.6 ANSI A108.17-2012: Installation of Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone.

.7 ANSI A118.1-2012: Dry-Set Portland Cement Mortar.

.8 ANSI A118.3-2012: Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy Adhesive.

.9 ANSI A118.4-2012: Latex-Portland Cement Mortar.

.10 ANSI A118.10-2012: Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.

.11 ANSI A118.12-2012: Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.

.12 ANSI A136.1-2012: Organic Adhesives for Installation of Ceramic Tile.

.13 ANSI A137.1-2012: Specification for Ceramic Tile.

.14 ASTM C627-10: Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.

.15 ASTM C847-14a: Standard Specification for Metal Lath.

.16 ASTM F1869-16: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

.17 CAN/CGSB-25.20-95: Surface Sealer for Floors.

.18 Terrazzo Tile and Marble Association of Canada (TTMAC): Specification Guide 09 30 00 - Tile Installation Manual 2016-2017.

1.3 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Verification Samples: 300 x 300 mm size panel, complete with approved grout colour; mounted to 19 mm thick plywood backer.

1.4 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Division 01.

.2 Closeout Submittals: duplicate copies of the latest edition of the TTMAC Hard Surface Maintenance Guide.

1.5 EXTRA STOCK MATERIALS

.1 Supply extra stock materials as specified in Division 01.

.2 Extra Stock Materials: 4 m^2 or 2 percent, whichever is the greater, of each type and colour of installed tile; clearly marked to identify:
.1 Manufacturer's name,
.2 Product's name,
.3 Product colour and pattern, and
.4 Building No. 158, University Centre Main Floor.

.3 Package tiles neatly in original containers, to prevent damage.

1.6 QUALIFICATIONS

.1 Installers: skilled mechanics trained and experienced in tile work, and registered as members of the Terrazzo Tile and Marble Association of Canada.

1.7 DELIVERY STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Store Products in a dry area, protected from freezing, staining and damage.

.3 Store cementitious materials on a dry surface.

1.8 AMBIENT CONDITIONS

.1 Do not install tiles at temperatures less than 12 degrees Celsius.

.2 Maintain temperatures at or above 12 degrees Celsius until cementitious materials have fully cured.

.3 Do not apply epoxy grouts at temperatures below 20 degrees Celsius or above 35 degrees Celsius.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers of epoxy grout having Product considered acceptable for use:
.1 Mapei.

.2 Manufacturers of tile setting accessories having Product considered acceptable for use:
.1 Schlüter Systems (Canada) Inc.

.3 Substitution Procedures: refer to Division 01.

2.2 PERFORMANCE CRITERIA

.1 Traffic Level Performance: floor tiles to meet Moderate Class, passing ASTM C627, cycles 1 through 10, as described in TTMAC Specification Guide 09 30 00.

2.3 TILE MATERIALS

.1 Porcelain Floor Tile (PFT): to ANSI A137.1; 300 x 600 mm size; Matte finish with rectified edges; Design Industry Series as distributed by Olympia Tile International Inc., colours as follows:
.1 PFT-1: Raw Grey.
.2 PFT-2: Raw Mix.

.2 Ceramic Wall Tile (CWT): to ANSI A137.1; 200 x 508 mm size; Matte finish; Epoca Loft Series as distributed by Centura Floor and Wall Fashions; colours as follows:
.1 CWT-1: Grey Gal 5.
.2 CWT-2: Grey Zing 3.
.3 CWT-3: Blue Atol 3.
.4 CWT-4: Blue / Blue 1.
.5 CWT-5: Orange Fusion.
.6 CWT-6: Green Pis.
.7 CWT-7: Blue Baltique 3.

.3 Cut Base Tile: 100 mm high, site-cut from floor tile, minimum one factory-formed edge along tile's length; type, size, colour and texture to match adjacent flooring material.

2.4 MORTAR AND GROUT MATERIALS

.1 Dry-Set Portland Cement Mortar: to ANSI A118.1.

.2 Latex-Portland Cement Mortar: to ANSI A118.4.

.3 Epoxy Grout: to ANSI A118.3; non-sagging, non-slumping, two-component 100 percent solids epoxy grout; Kerapoxy CQ by Mapei, colours as follows:
.1 Epoxy Grout for Use with Ceramic Wall Tile: 02 - Pewter by Mapei.
.2 Epoxy Grout for Use with Porcelain Floor Tile: 27 - Silver by Mapei.

2.5 ACCESSORIES

.1 Crack Isolation Membrane: loadbearing membrane, to ANSI A118.12, High Performance Rating.

.2 Reinforcing Mesh: 50 x 50 mm size; 1.6 mm thick steel wire mesh; welded fabric, galvanized.

.3 Metal Lath: galvanized type, 1.4 kg/m^2, to ASTM C847.

.4 Tape: 50 mm fibre mesh tape, as recommended by tile backer board manufacturer.

.5 Organic Adhesive: to ANSI A136.1, Type 1 for wet areas and Type 2 for dry areas.

.6 Water: clean, cold and potable.

.7 Joint Sealant: as specified in Section 07 92 00.

.8 Tile Sealer: to CAN/CGSB-25.20, Type 1 - Penetrating; as recommended by tile manufacturer.

2.6 MANUFACTURED COMPONENTS AND ACCESSORIES

.1 Tile Transition Strips: Extruded aluminum edge strips, 3 mm wide at top edge; with integral perforated anchoring leg for setting the strip into the setting material; height as required; Satin Nickel finish; JOLLY-AT by Schlüter Systems (Canada) Inc.

.2 Tile Tapered Transition Strips: Stainless steel transition strips; profile and height as indicated; with integral perforated anchoring leg for setting the strip into the setting material; sloped

transition and decorative edge strip for transition from tile to lower finish; Brushed finish; RENO-EBTK by Schlüter Systems (Canada) Inc.

.3 Tile Decorative Edge Trim: Extruded aluminum decorative edge trim with integral perforated anchoring leg for setting the strip into the setting material; complete with pre-formed corners; satin anodized finish; RONDEC-DB 14 AE by Schlüter Systems (Canada) Inc.

.4 Waterproofing Membrane System: to ANSI A118.10; soft polyethylene membrane with fleece webbing laminated on both sides; use special cut-width rolls and special shapes for corners and pipe sleeves; KERDI by Schlüter Systems (Canada) Inc.

2.7 MIXES

.1 Scratch Coat (by volume): 1 part Portland cement, 4 parts sand, and latex additive where required by TTMAC Detail. Premixed mortar may be used per manufacturer's instructions. Adjust water volume depending on moisture content of sand to obtain consistency and workability.

.2 Slurry Bond Coat: mix Portland cement and water to a creamy paste consistency. Include latex additive where required by TTMAC Detail.

.3 Levelling Coat (by volume): 1 part Portland cement, 4 parts sand, and latex additive where required by TTMAC Detail. Premixed mortar may be used per manufacturer's instructions.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Ensure substrates have been prepared to ANSI A108.01.

.3 Ensure substrate surfaces are clean, dimensionally stable, cured and free of contaminants such as oil, sealers and curing compounds.

.4 Ensure that concrete has been allowed to cure for a minimum of 28 days.

.5 Ensure concrete floors have not been treated with proprietary curing compounds.

.6 Ensure concrete floors scheduled to receive thin-set applied tile or cleavage membranes are steel trowelled to a fine broom finish.

.7 Ensure concrete floors scheduled to receive tile applied over a bonded mortar bed have been screed finished. Verify substrate surface variation does not exceed 6 mm in 3 metres.

.8 Ensure concrete slabs have been finished with a maximum permissible variation of 3 mm in 3.0 metres from the required plane and not more than 1.5 mm in 305 mm when measured from high points in the surface.

.9 Conduct moisture vapour emission rate (MVER) tests on concrete slabs to ASTM F1869. Do not proceed with flooring installation until tests indicate maximum 1.45 kg per 100 sm for a 24 hour period.

3.2 PREPARATION

.1 Protect surrounding work from damage or disfiguration.

.2 Thoroughly clean existing surfaces which are to receive tile finish to ensure the removal of grease, oil and dust film.

.3 Apply a latex modified cementitious levelling coat wherever the concrete slab does not meet the specified tolerance for flatness and levelness, and where slight irregularities exist. Limit levelling coat thickness to maximum 8 mm thick.

.4 Install crack isolation membrane over concrete slabs to ANSI A108.17. If crack isolation membrane is applied over rough surface, apply a 6 mm thick sand-bed under crack isolation membrane.

.5 Waterproofing Membrane: to ANSI A108.13, and as follows:
- .1 Fully adhere waterproof membrane to substrate with tile setting adhesive, with no air pockets.
- .2 Overlap and seal membrane seams a minimum 50 mm.
- .3 Alternately, tightly butt adjacent sheets and cover with a 125 mm strip of waterproofing membrane sealed to primary membranes.
- .4 Provide strips of waterproofing where required to span expansion joints or terminate waterproofing into movement-joint type tile-setting accessories, as detailed per manufacturer's instructions.
- .5 Adhere waterproofing membrane to fixtures, joints around pipes, door and window frames, etc. with transparent waterproof sealant.

.6 Cover backer board joints with fibre mesh tape set in latex-Portland cement mortar.

3.3 INSTALLATION

.1 Install Products to TTMAC Specification Guide 09 30 00, as scheduled below.

.2 Apply tile using water-resistant organic adhesives to ANSI A108.4.

.3 Apply tile using dry-set Portland cement mortar or latex-Portland cement mortar beds to ANSI A108.5.

.4 Install tiles with straight, true, even, and uniform joints. Make tile joints approximately 3 mm wide, unless recommended otherwise by tile manufacturer.

.5 Fit tile units around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance.

.6 Make cut edges smooth, even and free from chipping. Do not split tile.

.7 Lay out tiles according to patterns indicated on Drawings. Ensure perimeter and cut tiles are minimum half size.

.8 Set tiles in place while bond coat is wet and tacky, prior to skinning over. Slide tile back and forth to ensure a proper bond and level surface. Ensure tiles are flush with adjacent tiles, avoiding lippage.

.9 Clean backs of tiles and back butter tiles to ensure a 95 percent bond coverage.

.10 Clean excess mortar from surface prior to final set.

.11 Sound tiles after setting materials have cured and replace hollow sounding tile before grouting.

.12 Exterior Surfaces and Wet Areas (Thin Set Method): Notch adhesive in straight lines, backbutter tile and set on freshly trowelled thin-set mortar. Move tile back and forth perpendicular to notches.

.13 Ungauged Slate, Marble, Stone and Large Ceramics: Immediately prior to setting, backbutter tile through a push box or box screed to achieve a uniform thickness of tile and mortar.

.14 Install site-cut tiles with site-cut edges concealed within either a grouted joint or a metal trim. Visually expose only factory-made edges.

.15 Keep two-thirds the depth of grout joints free of setting material.

3.4 MOVEMENT JOINTS

.1 Install control and expansion joints to TTMAC Detail 301MJ.

.2 Keep control joints and expansion joints free of setting materials.

.3 In addition to the locations described in TTMAC Specification Guide 09 30 00, Provide movement joints over cold joints, saw cuts, at columns and at wall plane changes.

3.5 TILE-SETTING ACCESSORIES INSTALLATION

.1 Install tile-setting accessories in continuous lengths, to level straight lines by pressing the perforated anchoring leg of the accessory solidly into the tile setting adhesive.

.2 Butt ends of units tightly together with hairline joint. Trowel an additional layer of tile setting material over the anchored leg of the accessory prior to placement of tiles.

.3 Unless specified otherwise, solidly embed tiles over anchoring leg of installed trim with surface of tile flush with top of tile-setting accessories.

.4 Leave 3 mm joint between tile and tile-setting accessories for filling with grout.

.5 Install pre-formed corners, end-caps and trim at changes in direction and at terminations. Mitered joints will be rejected.

.6 Expansion and Control Joints: Solidly embed tiles over installed edge strips with joint surface either flush with top of joint or 1 mm below top of tile.

3.6 GROUTING

.1 Allow proper setting time prior to grouting.

.2 Preseal tiles requiring protection from grout staining.

.3 Apply epoxy grout to ANSI A108.6.

.4 Force grout into joints to ensure dense finish.

.5 Remove excess and polish with clean cloths.

3.7 FIELD QUALITY CONTROL

.1 Inspect completed work and replace broken, cracked, or damaged tile.

3.8 TOLERANCES

.1 Level tiles to conform to a 1 mm tolerance over a 3 mm joint.

3.9 CLEANING

.1 Refer to Division 01.

.2 Apply tile sealer to floor tiles.

3.10 PROTECTION

.1 Protect finished areas from traffic until setting materials have sufficiently cured.

.2 Protect grouted areas from traffic for 24 hours after grouting.

.3 Provide protective covering until Owner occupancy.

.4 Protect wall tiles and bases from impact, vibration, heavy hammering on adjacent and opposite walls for at least 14 days after installation.

3.11 SCHEDULE

.1 Tile Installed Over Masonry or Concrete Walls - Thin-Set Method: TTMAC Detail 303W.

.2 Tile Installed Over Gypsum Board - Thin-Set Method: TTMAC Detail 304W.

.3 Tile Installed on Coated Glass Mat Backer Board: TTMAC Detail 305W (B - Interior Wet/Dry Areas).

.4 Tile Bonded to Concrete Slab - Thin-Set Method: TTMAC Detail 311F (A - Interior/Exterior), (C - Crack Concrete Interior/Exterior - Full Coverage) or (D - Uncoupling Over Green/Young Concrete).

.5 Large Format Tile on Interior Floors: TTMAC Detail 329 LFT.

.6 Large Format Tile on Interior Walls: TTMAC Detail 330 LFTW.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies.

.2 Section 09 84 13 - Fixed Sound-Absorptive Panels.

.3 Section 21 13 13 - Wet Pipe Fire Suppression.

.4 Section 23 37 13 - Diffusers, Registers and Grilles.

.5 Section 26 51 13 - Lighting Equipment.

1.2 REFERENCES

.1 ASTM A123/A123M-15: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A153/A153M-16: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.3 ASTM A641/A641M-09a(2014): Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

.4 ASTM C635/C635M-13: Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

.5 ASTM C636/C636M-13: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

.6 ASTM E1264-14: Standard Classification for Acoustical Ceiling Products.

.7 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.8 Ceiling & Interior Systems Construction Association (CISCA): Ceiling Systems Handbook.

.9 Underwriters Laboratories of Canada: List of Equipment and Materials.

1.3 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Samples: one for each specified tile and panel, 140 x 290 mm size, indicating texture, pattern, colour and edge profile.

1.4 EXTRA STOCK MATERIALS

.1 Supply extra stock materials as specified in Division 01.

.2 Extra Stock Materials: minimum two full bundles for each lay-in tile ceiling Product, colour and pattern; clearly marked to identify:
.1 Manufacturer's name,
.2 Product's name,
.3 Product colour and pattern.

.3 Store bundles in original undamaged packages, in a warm, dry area.

1.5 QUALIFICATIONS

.1 Installer: a firm specializing in the installation of suspended grid and lay-in tile ceiling systems, having a minimum of 3 years documented experience, and a member in good standing of the Interior Systems Contractors Association of Ontario (ISCA).

1.6 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products undamaged original containers.

.3 Store Products in warm, dry area.

1.7 AMBIENT CONDITIONS

.1 Do not install Products until HVAC system is operational.

.2 Locate wood Products in the area of the Work at least 72 hours before beginning installation to allow materials to reach temperature and moisture content equilibrium.

.3 Maintain the following environmental conditions for 24 hours before, during and after installation:
.1 Relative Humidity: maximum 55 percent.
.2 Ambient Air Temperature: between 15 degrees C and 30 degrees C.

1.8 EXISTING CONDITIONS

.1 Where existing ceilings are required to be patched, use existing matching acoustic tile removed from other areas.

.2 Protect material designated for re-use.

.3 Existing material for re-use shall be inspected and approved by the Consultant prior to installation.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Armstrong World Industries.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Acoustic Ceiling Tile (ACT-1): wet-formed mineral fiber non-sagging lay-in tile, to ASTM E1264, Type IV, Form 2, Pattern E; complete with anti-mould and mildew treatment, and sag resisting treatment; as follows:
.1 Size: 610 x 1,220 mm size,
.2 Thickness: 19 mm.
.3 Pattern: Fine texture.
.4 Edge: Bevelled tegular.
.5 Weight: 5.13 kg/m^2.
.6 Finish: acoustically transparent membrane with factory-applied latex paint, White colour.
.7 Fire Resistance (CAN/ULC S102): Class A.
.8 Noise Reduction Coefficient: 0.70.
.9 Light Reflectance: 0.90.
.10 Manufacturer and Product Name: Ultima - 1914 by Armstrong World Industries.

.2 Suspended Ceiling Grid (SCG): to ASTM C635/C635M, Class HD, commercial quality, cold rolled steel, non-fire rated; main tees, cross tees and grid adapters with exposed 24 mm T-shape, 43 mm high; die cut and interlocking components; baked enamel coating; Prelude XL by Armstrong World Industries.

.3 Exposed Perimeter Trim: extruded aluminum, C-shape straight profile, 19 mm wide, 152 mm high; complete with pre-mitred inside and outside corner units; baked enamel coating; Axiom Classic - AX6STR by Armstrong World Industries.

.4 Accessories: stabilizer bars, clips, splices, edge mouldings, and hold down clips required for suspended grid system; same material and finish as suspended grid.

.5 Support Channels and Hangers: galvanized steel, to rigidly secure ceiling system with maximum deflection of L/360.

.6 Hanger Wire: to ASTM A641/A641M, zinc-coated, soft-annealed, 3.77 mm OD steel wire.

.7 Tie Wire: to ASTM A641/A641M, zinc-coated, soft-annealed, 1.21 mm OD steel wire.

2.3 FINISHES

.1 Galvanized Coating on Steel Components: hot dipped zinc coating, to ASTM A123/A123M, Z275 coating designation.

.2 Galvanized Coating on Steel Hardware: hot dipped zinc coating, to ASTM A153/A153M, Class B2.

.3 Baked Enamel Coating on Ceiling Grid and Trim: one coat of zinc oxide primer sprayed and baked followed by two coats of semi-gloss enamel sprayed and baked; White colour.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify layout of hangers will not interfere with other work.

.3 Verify ducts, pipes, fittings and other penetrations have been properly installed.

3.2 SUSPENDED CEILING GRID

.1 Install suspended ceiling grid to ASTM C636/C636M, and CISCA installation standards.

.2 Hang ceiling grid directly from structural elements, independent of walls, columns, metal deck, ducts, pipe fittings and conduit. Provide additional support channels and hangers as required.

.3 Space hangers at maximum 1,220 mm OC along supporting grillage, and not more than 150 mm OC from ends. Do not place hangers in front of access panels.

.4 Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers to span the extra distance.

.5 Install additional hangers and reinforcing to accommodate loads being carried.

.6 Provide suspension hanger at each corner of suspended fixtures, and at maximum 610 mm OC around perimeter of fixture.

.7 Locate ceiling grid system on room axis leaving equal border units according to reflected ceiling plan.

.8 Install main tees suspended at maximum 1,220 mm OC and maximum 600 mm from wall.

.9 Install cross tees and grid adapters perpendicular to main tees, and interlock with main tees.

.10 Frame around fixtures and openings.

.11 Install edge moulding at intersection of ceiling and vertical surfaces.

.12 Install exposed perimeter trim at exposed system edges where indicated on Drawings.

.13 Form expansion joints as detailed. Form to accommodate plus or minus 25 mm movement. Maintain visual closure.

3.3 ACOUSTIC CEILING TILES

.1 Fit lay-in tiles in place, free from damaged edges.

.2 Neatly cut lay-in tiles to accommodate necessary penetrations.

.3 Cut and rabbet lay-in tiles at border areas and vertical surfaces.

.4 Lay directional patterned units one way with pattern parallel to longest room axis. Fit border neatly against abutting surfaces.

.5 Install hold-down clips to retain lay-in tiles tight to grid system.

3.4 TOLERANCES

.1 Variation from Flat and Level Surface: 3 mm in 3.0 metres.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Concrete Unit Masonry.

.2 Section 09 21 16 - Gypsum Board Assemblies.

.3 Section 09 68 13 - Tile Carpeting.

1.2 REFERENCES

.1 ASTM F1861-08(2012)e1: Standard Specification for Resilient Wall Base.

1.3 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Samples: duplicate 100 mm long samples, illustrating colour selection.

1.4 CLOSEOUT SUBMITTALS

.1 Submit maintenance data as specified in Division 01.

.2 Maintenance Data: duplicate copies of manufacturers' printed maintenance and cleaning instructions.

1.5 EXTRA STOCK MATERIALS

.1 Supply extra stock materials as specified in Division 01.

.2 Extra Stock Materials: 6 m^2 or 3 percent, whichever is the greater, of each Product, colour and pattern; clearly marked to identify:
.1 Manufacturer's name,
.2 Product's name,
.3 Product colour and pattern.

.3 Package Products neatly in original containers, to prevent damage.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver and store Products undamaged in original wrapping or cartons.

.3 Store Products for a minimum of three days prior to installation in warm dry room with boxes stacked not more than four high.

1.7 AMBIENT CONDITIONS

.1 Maintain ambient air temperature of 20 degrees Celsius three days prior to, during, and 48 hours after installation of flooring materials.

.2 Maintain ambient air relative humidity (RH) level between 35 to 55 percent.

.3 Do not install Products in conditions of high humidity or where exposed to cold drafts.

.4 In hot weather, protect Products from direct sunlight.

.5 Provide adequate ventilation.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Products considered acceptable for use:
.1 Tarkett Johnsonite.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Resilient Base (RB-1): 6.4 mm thick thermoplastic rubber, to ASTM F1861, Type TP, Group 1, Style A - Straight; 114 mm high; complete with pre-moulded end stops and external corners; Tightlock Carpet Base by Tarkett Johnsonite, colours as selected by Consultant.

.2 Resilient Base (RB-2): 3.2 mm thick thermoset vulcanized rubber, to ASTM F1861, Type TS, Group 1, Style A - Straight; 102 mm high; complete with pre-moulded end stops and external corners; Baseworks Thermoset Rubber Wall Base by Tarkett Johnsonite, colours as selected by Consultant.

.3 Adhesive: contact adhesive, water-based formulation; Johnsonite #946 Premium Contact Adhesive by Tarkett Johnsonite.

.4 Subfloor Filler: white premix latex; as recommended by manufacturer.

.5 Primers: waterproof; as recommended by manufacturer.

.6 Sealers and Wax: as recommended by manufacturer.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify surfaces are dry, true, even and smooth, and free of paint, grease and oil.

.3 Verify surfaces designated to receive resilient base are even, smooth, free of gaps, holes and depressions.

3.2 PREPARATION

.1 Clean substrate to remove deleterious matter which would impair adhesion of Products.

.2 Prepare substrate to a smooth and flat surface, as follows:
.1 Remove ridges and bumps by grinding or other means.
.2 Fill low spots, cracks, joints, holes, and other defects with filler.
.3 Apply, trowel and float filler to leave smooth, flat, hard surface.
.4 Prohibit traffic until filler is cured.
.5 Vacuum clean substrate.

.3 Prime substrate as and when recommended to ensure proper adhesion of Products.

3.3 INSTALLATION

.1 Install base on solid backing.

.2 Bond Products tight to surfaces.

.3 Mitre internal corners.

.4 Use only premolded units at exposed ends and external corners.

.5 Scribe and fit base to door frames and other interruptions.

3.4 CLEANING

.1 Refer to Division 01.

.2 Clean, seal and wax installed Products.

3.5 PROTECTION

.1 Refer to Division 01.

.2 Protect completed installation with suitable and durable materials until Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 09 30 00 - Tiling.

.2 Section 09 65 13 - Resilient Base and Accessories.

1.2 REFERENCES

.1 ASTM F1869-16: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

.2 ASTM F2170-16a: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using Insitu Probes.

.3 CAN/CGSB-71.28-M88: Adhesive, for Direct Glue-Down Carpet Installation.

.4 CRI 104-2002: Standard for Installation Specification of Commercial Carpet.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: manufacturers' data sheets on specified Products, describing physical and performance characteristics; sizes, patterns, colours available, and method of installation.

1.4 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: duplicate complete sets, 150 x 150 mm in size; illustrating colour and pattern selection for each carpet tile specified.

1.5 CLOSEOUT SUBMITTALS

.1 Submit maintenance data as specified in Division 01.

.2 Maintenance Data: duplicate copies of manufacturers' printed maintenance and cleaning instructions.

1.6 EXTRA STOCK MATERIALS

.1 Supply extra stock materials as specified in Division 01.

.2 Extra Stock Materials: minimum 4 percent for each specified carpet tile Product, colour and pattern; clearly marked to identify:
.1 Manufacturer's name,
.2 Product's name,
.3 Product colour and pattern.

.3 Package Products neatly in original containers, to prevent damage.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products in original packaging, with each package having its register number properly marked on each bale.

.3 Protect Products from damage, dirt, stains and moisture.

1.8 AMBIENT CONDITIONS

.1 Maintain ambient air temperature at 21 degrees Celsius for 48 hours before, during and after installation.

.2 Maintain substrate temperature at 10 degrees Celsius.

1.9 WARRANTY

.1 Submit system and manufacturer's product extended warranties in accordance with the General Conditions of the Contract.

.2 System Warranty: a 2 year extended warranty including coverage against loose fitting, breaking or unraveling of seams or breaking away from sub-base, and failure of materials or workmanship which proves detrimental to the appearance or performance of the carpeting.

.3 Manufacturer's Product Warranty: submit to Owner a 10 year manufacturer's product warranty to include coverage for wear, colour fading and deterioration of backing materials.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Milliken.
.2 Tandus Centiva.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Carpet Tile (CP-1): 610 x 610 mm size tiles; patterned Symtex construction; as follows:
.1 Face Weight: 848 g/m^2.
.2 Fiber System: Dynex SD nylon.
.3 Gauge: 50.4 rows per 10 cm.
.4 Stitch Count: 40.9 stitches per 10 cm.
.5 Pile Height: 4.7 mm.
.6 Colour: as selected by Consultant.
.7 Manufacturer and Product Name: Avant 04840 by Tandus Centiva.

.2 Carpet Tile (CP-2): 610 x 610 mm size tiles; patterned loop construction; as follows:
.1 Face Weight: 712 g/m^2.
.2 Fiber System: Dynex SD nylon.
.3 Gauge: 50.4 rows per 10 cm.
.4 Stitch Count: 39.4 stitches per 10 cm.
.5 Pile Height: 4.7 mm.
.6 Colour: minimum 3 colours, as selected by Consultant.
.7 Manufacturer and Product Name: Metri 04654 by Tandus Centiva.

.3 Carpet Tile (CP-3): 1000 x 1000 mm size tiles; tufted textured loop construction; as follows:
.1 Face Weight: 509 g/m^2.
.2 Fiber System: Type 6/6 nylon.
.3 Pile Height: 3.3 mm.
.4 Colour: minimum 2 colours, as selected by Consultant.
.5 Manufacturer and Product Name: Fahrenheit Collection, Front or Wave Style, by Milliken.

.4 Carpet Adhesive: to CAN/CGSB-71.28-M, solvent free, latex based waterproof adhesive; Eco Tech 9600 by Chembond Ltd.

.5 Seam Adhesive: latex seam sealer or thermoplastic adhesive.

.6 Sub-Floor Filler: white premix latex type.

.7 Transition Strips: as specified in Section 09 30 00.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify concrete floors are cured a minimum of 28 days, and that the slab surface has a pH level in the range of 5 to 11.

.3 Conduct moisture vapour emission rate (MVER) tests on concrete slabs to ASTM F1869. Do not proceed with flooring installation until tests indicate maximum 2.27 kg per 100 sm for a 24 hour period.

.4 Conduct relative humidity (RH) tests on concrete slabs to ASTM F2170. Do not proceed with flooring installation until tests indicate maximum 75 percent relative humidity.

3.2 PREPARATION

.1 Remove subfloor ridges and bumps.

.2 Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

3.3 INSTALLATION

.1 Install Products to CRI 104 for Direct Glue-Down Installation Method.

.2 Lay carpet tile in manufacturer-recommended patterns.

.3 Verify carpet tile pattern match to ensure minimal variation between dye lots.

.4 Lay carpet tile with joints and seams parallel to building lines to produce symmetrical tile patterns. Provide perimeter tile of similar size within any given area.

.5 Lay carpet tile continuously from wall to wall in each area, including beneath casework.

.6 Cut and fit carpet tiles around interruptions.

.7 Fit carpet tiles tight to intersection with vertical surfaces without gaps.

3.4 CLEANING

.1 Refer to Division 01.

.2 Remove dirt, carpet scraps, and threads from carpet surface.

.3 Clean carpet with a beater-type vacuum cleaner.

.4 Remove soiled spots or adhesive from carpet with a proper spot remover.

.5 Remove loose pieces of face yarn with sharp scissors.

3.5 PROTECTION

.1 Refer to Division 01.

.2 Protect completed installation with protective covering until Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies.

.2 Section 09 51 23 - Acoustical Tile Ceilings.

1.2 REFERENCES

.1 ASTM C423-09a: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

.2 ASTM E90-09: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.3 CAN/ULC S114-05: Standard Method of Test for Determination of Non-Combustibility in Building Materials.

.4 CAN/ULC S702-09-AM1: Standard for Mineral Fibre Thermal Insulation for Buildings.

.5 ULC S702.2-10: Mineral Fibre Thermal Insulation for Buildings, Part 2: Application Guidelines.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Store Products away from construction activity and sources of ignition.

.3 Protect Products from damage during handling, installation and at point of installation.

2 Products

2.1 MANUFACTURERS

.1 Manufacturer having Product considered acceptable for use:
.1 Owens-Corning Canada Inc.

.2 Substitution Procedures: refer to Division 01.

2.2 MATERIALS

.1 Acoustical Insulation: mineral fibre acoustical batts, to CAN/ULC S702, Type 1; non-rigid, friction fit type, manufactured from glass, rock or slag:
.1 Noise Reduction Coefficient: 1.10 at 100 mm thickness, to ASTM C423.
.2 Facing: Unfaced.
.3 Density: minimum 40 kg/m^3.
.4 Combustibility: Noncombustible to CAN/ULC S114.
.5 Thickness: as indicated on Drawings.
.6 Manufacturer and Product Name: QuietZone by Owens-Corning Canada Inc.

.2 Mechanical Fasteners: stainless steel screw type fastener, complete with 75 mm OD moulded plastic disc washer.

.3 Adhesive: mastic type, synthetic rubber base, fungi resistant, gun or trowel application.

3 Execution

3.1 INSTALLATION

.1 Install Product to ULC S702.2 and ASTM E90.

.2 Install Product in spaces without gaps and voids.

.3 Fit acoustic insulation tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

3.2 PROTECTION

.1 Refer to Division 01.

.2 Protect installed Product at the end of each Working Day.

.3 Protect installed Product in areas where welding will be carried out.

.4 Replace installed Product damaged by others.

.5 Protect installed Product requiring a thermal barrier in accordance with the authorities having jurisdiction.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Concrete Unit Masonry.

.2 Section 07 92 00 - Joint Sealants.

.3 Section 09 21 16 - Gypsum Board Assemblies.

.4 Section 09 51 23 - Acoustical Tile Ceilings.

.5 Section 09 81 00 - Acoustic Insulation.

1.2 REFERENCES

.1 ASTM A641/A641M-09a(2014): Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

.2 ASTM C423-09a: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

.3 ASTM E84-16: Standard Test Method for Surface Burning Characteristics of Building Materials.

.4 Ceilings & Interior Systems Construction Association (CISCA): Code of Practices.

.5 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: published data and certification that Product complies with specified design criteria.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: indicating panels sizes, methods of attachment, frequency of fasteners, and panel configuration.

.3 Field measure areas prior to determining panel layout on Shop Drawings.

1.5 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Samples: duplicate 150 x 150 mm size samples, illustrating full range of exposed texture, and conditions of panel edges and ends.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Store materials stacked on a raised platform clear of the ground, and adequately protected from weather using waterproof coverings.

.3 Protect edges and surfaces from marring, soil and damage.

.4 Cover bottom of stacks with a moisture-proof membrane, allowing for adequate air circulation to prevent condensation.

.5 Protect material from water damage.

1.7 AMBIENT CONDITIONS

.1 Do not install Product until building is enclosed and HVAC system is operational.

.2 Locate Products in the area of the Work at least 72 hours before beginning installation to allow materials to reach temperature and moisture content equilibrium.

.3 Maintain the following environmental conditions for 24 hours before, during and after installation:
.1 Relative Humidity: maximum 80 percent.
.2 Ambient Air Temperature: between 15 degrees C and 30 degrees C.

2 Products

2.1 MANUFACTURERS

.1 Manufacturer having Product considered acceptable for use:
.1 ezoBord.

.2 Substitution Procedures: refer to Division 01.

2.2 DESIGN CRITERIA

.1 Design panels to meet the following criteria:
.1 Noise Reduction Coefficient (ASTM C423): 0.75.
.2 Fire Rating (ASTM E84 and CAN/ULC-S102): Class A.

2.3 MATERIALS

.1 Wave Canopies: 2,130 x 910 mm size, 13 mm thick thermoformed polyester panels; arc and reverse arc designs; ezoBord Canopies by ezoBord, two colours as selected by Consultant.

.2 Sloped Linear Panels: 1,219 x 2,420 mm size panels, 9 mm thick polyester panels; ezoBord Panels by ezoBord, 4 colours as selected by Consultant.

.3 Carrying Channels: as specified in Section 09 21 16.

.4 Fasteners: 28.5 mm OD re-closable fasteners, Type 250 stem pattern; as recommended by panel manufacturer.

.5 Adhesive: Clear drying, contractor grade; No More Nails.

.6 Tape: high bond double-sided tape; ezoTape by ezoBord.

.7 Hanger Wire: to ASTM A641/A641M, zinc-coated, soft-annealed, 3.77 mm OD steel wire.

.8 Tie Wire: to ASTM A641/A641M, zinc-coated, soft-annealed, 1.21 mm OD steel wire.

2.4 FABRICATION

.1 Fabricate Products in strict accordance with accepted Shop Drawings.

.2 Provide finished openings and recesses for fixtures, fittings and devices.

.3 Reinforce large panels for rigid, sturdy construction.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Inspect surfaces scheduled to receive panels for unevenness, irregularities and dampness that would affect quality and execution of work.

3.2 INSTALLATION

.1 Securely install Products in accordance with CISCA Code of Practices, and accepted Shop Drawings.

.2 Install Products in patterns and configurations indicated on Drawings.

.3 Install carrying channels straight, square and level.

.4 Space visually-exposed fasteners and hanger wires evenly in both directions. Make hanger wires and connections neat and visually acceptable to Owner and Consultant.

3.3 CLEANING

.1 Refer to Division 01.

.2 Clean exposed surfaces of installed Products in accordance with manufacturer's printed instructions.

.3 Remove and replace damaged Product.

3.4 PROTECTION

.1 Refer to Division 01.

.2 Protect installed Products and assemblies from damage until Owner occupancy.

END OF SECTION

1 General

1.1 PRODUCTS FURNISHED OR INSTALLED UNDER OTHER SECTIONS

.1 Carefully examine the scope of the Work as indicated on the Drawings, and include all finishing, whether specifically mentioned or not, except as specifically excluded below:
- .1 Section 05 50 00 - Metal Fabrications: shop priming.
- .2 Section 06 40 00 - Architectural Woodwork: shop finishing.
- .3 Section 07 18 13 - Pedestrian Traffic Coating: integral colour.
- .4 Section 08 12 13 - Hollow Metal Frames: galvannealed coating.
- .5 Section 08 71 00 - Door Hardware: shop finishing.
- .6 Section 09 51 23 - Acoustical Tile Ceilings: shop finishing.
- .7 Section 10 11 00 - Visual Display Boards: shop finishing.
- .8 Section 10 14 00 - Signage: shop finishing.
- .9 Section 10 28 13 - Toilet Accessories: shop finishing.
- .10 Section 12 24 13.16 - Manual Roller Window Shades: anodized coating.
- .11 Do not paint plated, polished or anodized metal components.
- .12 Do not paint stainless steel components.

1.2 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 05 50 00 - Metal Fabrications.

.3 Section 06 10 00 - Rough Carpentry.

.4 Section 06 20 00 - Finish Carpentry.

.5 Section 08 12 13 - Hollow Metal Frames.

.6 Section 08 14 00 - Wood Doors.

.7 Section 09 21 16 - Gypsum Board Assemblies.

.8 Section 20 05 53 - Identification of Mechanical Services.

1.3 REFERENCES

.1 Master Painters Institute (MPI): Architectural Painting Specification Manual.

.2 Master Painters Institute (MPI): Maintenance Repainting Manual.

.3 Steel Structures Painting Council (SSPC): Painting Manual, Volume 2 - Systems and Specifications.

.4 University of Guelph Design Standard RD-01: Painting.

1.4 SCHEDULING

.1 Schedule painting operations to prevent disruption to the Work.

.2 Schedule painting operations in occupied facilities to prevent disruption of occupants in and about the building. Conduct painting, after facility working hours in accordance with Owner's operating requirements.

.3 Schedule work such that painted surfaces will have dried before occupants are affected.

.4 Obtain written authorization from Consultant for changes in work schedule.

1.5 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: manufacturers' printed literature for each finishing Product being used, with the relevant MPI finish system identified, and the volatile organic compound (VOC) content and volume solids (VOL SOL) content highlighted.

1.6 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: a full range of colour selector samples for each type of paint or stain required.

.3 Verification Samples: If requested by Consultant, prepare sample panels, 1.0 square metre minimum size. Apply finish material to the actual surface or acceptable alternate if required to be portable.

1.7 QUALIFICATIONS

.1 Applicators: a firm specializing in the commercial painting and finishing of buildings in accordance with the MPI Architectural Painting specification Manual and the MPI Maintenance Repainting Manual, and having a minimum of 10 years documented experience.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Refer to Division 01.

.2 Deliver Products in original containers with unbroken seals and labelled to indicate the name of the manufacturer, brand, colour and quality of the contents.

.3 Store thinners, loose soaked rags and similar combustible materials in closed containers. Remove from site or store in an assigned area.

.4 Provide adequate safe-guards against spontaneous combustion of finishing materials.

.5 Arrange for a properly enclosed and heated space, satisfactory to Consultant, to be used as a paint shop. Store paint materials in a minimum temperature of 10 degrees C.

1.9 AMBIENT CONDITIONS

.1 Conform to MPI Architectural Painting Specification Manual.

.2 Apply water-based paints only when temperature of surfaces to be finished and surrounding air temperatures are between 10 degrees C and 30 degrees C.

.3 Apply solvent-thinned paints only when temperature of surfaces to be finished and surrounding air temperatures are between 6 degrees C and 32 degrees C.

.4 Do not apply finishes in snow, rain, fog or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 2 degrees C above the dew point; or to damp or wet surfaces.

2 Products

2.1 MANUFACTURERS

.1 Manufacturer: use only Products from manufacturers listed in the MPI Architectural Painting Specification Manual.

.2 Single-Source Responsibility: Provide primers and undercoats produced by the same manufacturer as the finish coats.

2.2 DESCRIPTION

.1 Gloss Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following gloss level categories, as defined in the MPI Architectural Painting Specification Manual:
.1 Gloss Level G1: Matte or Flat finish.
.2 Gloss Level G2: Velvet finish.
.3 Gloss Level G3: Eggshell finish.
.4 Gloss Level G4: Satin finish.
.5 Gloss Level G5: Semi-Gloss finish.
.6 Gloss Level G6: Gloss finish.
.7 Gloss Level G7: High-Gloss finish.

.2 Colours: a maximum of 20 interior colours may be required. There may be more than two colours used in each room or space.

2.3 PERFORMANCE CRITERIA

.1 Volatile Organic Compound Content (VOC): Use only ECOLOGO paints and coatings having a volatile organic compound (VOC) content as follows:
.1 Gloss Level G1: < 50 g/L.
.2 Gloss Levels G2-G7: < 150 g/L.

.2 Volume Solids Content (VOL SOL): Use only paints and coatings having a volume solids (VOL SOL) content as follows:
.1 Alkyd Paints and Coatings: $\geq$ 45 percent.
.2 Latex Paints and Coatings: $\geq$ 40 percent.

2.4 MATERIALS

.1 Paints and Coatings: use only Products meeting the specified performance criteria and listed in the most current Approved Products List included in the MPI Architectural Painting Specification Manual, for each specified paint and finish system.

.2 Paint Accessory Materials: linseed oil, shellac, turpentine, and other materials, of commercial quality.

2.5 MIXING

.1 Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage, that can and will be dispersed readily and uniformly by paddle to a complete homogeneous mixture.

.2 Carefully mix and prepare paint materials according to manufacturer's directions.

.3 Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

.4 Stir material before application to produce a mixture of uniform density. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

.5 Use only thinners approved by paint manufacturer, and only within recommended limits.

.6 Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the colour of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Measure moisture content of surfaces using an electronic moisture metre. Do not apply finishes unless moisture content of surfaces are below the recommended maximum.

3.2 PREPARATION

.1 Prepare new surfaces to MPI Architectural Painting Specification Manual.

.2 Prepare existing surfaces designated to be re-finished to MPI Maintenance Repainting Manual and University of Guelph Design Standard RD-01, Level 4 - Supreme.

.3 Mask out surrounding surfaces not to receive paint, to protect from overspray or overbrushing.

.4 Remove hardware and accessories, plates, machined surfaces, lighting fixtures and similar items already installed but not intended to be painted.

.5 Remove mildew, efflorescence and all foreign material from surfaces by appropriate methods.

.6 Correct minor defects and deficiencies in surfaces which affect the work of this Section.

.7 Clean and prepare surfaces to be painted according to manufacturers' instructions for each particular substrate condition and finish system.

.8 Provide barrier coats over incompatible primers.

.9 Clean ungalvanized ferrous metal surfaces designated to receive site finish. Use solvent or mechanical cleaning methods to SSPC Painting Manual, Volume 2 - Systems and Specifications.

.10 Clean galvanized surfaces with non-petroleum-based solvents. Surface to be free of oil and surface contaminants. Remove pretreatment from galvanized steel metal fabricated from coil stock by mechanical methods.

3.3 APPLICATION

.1 Apply Products in accordance with MPI Architectural Painting Specification Manual and University of Guelph Design Standard RD-01.

.2 Protect exterior surfaces and areas, including landscaping, walks, drives, and 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.

.3 Protect 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. Make Good damage caused by failure to provide protection.

.4 Erect barriers or screens and post signs to warn of or limit or direct traffic away or around work areas as required.

.5 Use methods best suited for substrate and type of material being applied.

.6 Do not use compressed air or aerosol methods of application without the prior written approval of the Consultant.

.7 Spread finishes evenly and flow on smoothly without runs or sags.

.8 Apply Products no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by the manufacturer.

.9 Apply Products under adequate illumination.

.10 Sand lightly between coats to achieve required finish.

.11 Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

.12 Back prime interior wood work with enamel primer sealer paint.

.13 Back prime exterior wood work with exterior primer paint.

.14 Pigmented (Opaque) Finishes: completely cover substrate to a smooth, opaque surface of uniform finish, colour, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be accepted.

.15 Transparent (Clear) Finishes: use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, colour irregularity, runs, brush marks, orange peel, nail holes or other surface imperfections.

.16 Match approved samples for colour, texture and coverage. Remove, refinish or repaint work not complying with specified requirements.

3.4 FACILITY SERVICES

.1 Unless otherwise specified or noted, paint "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 exterior and interior areas.
- .2 in interior high humidity interior areas.
- .3 in mechanical and electrical rooms.

.2 Remove finished louvres, grilles, covers, and access panels on mechanical and electrical components from location and paint separately. Finish paint primed equipment to colour as selected by Consultant.

.3 Paint the inside of air ducts, convection and baseboard heating cabinets where visible behind louvers, grilles and diffusers for a minimum of 460 mm or beyond sight line, whichever is greater with primer and one coat of matt black (non-reflecting) paint.

.4 Paint the inside of light valances gloss white.

.5 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.6 Paint red or band fire protection piping and sprinkler lines in accordance with mechanical specification requirements. Keep sprinkler heads free of paint.

.7 Paint yellow or band natural gas piping in accordance with mechanical specification requirements.

.8 Backprime and paint face and edges of plywood service panels a semi-gloss, gray colour before installation of telephone and electrical equipment. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.9 Colour code equipment, piping, conduit, and exposed ductwork in accordance with colour schedule. Colour band and identify with flow arrows, names, and numbering.

.10 In unfinished areas, leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches ad marks.

.11 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by equipment manufacturer.

.12 Do not paint over nameplates.

3.5 FIELD QUALITY CONTROL

.1 Inspect surfaces, preparation and paint applications.

.2 Painted surfaces shall be considered to lack uniformity and soundness if any of the following defects are apparent to the inspector:
- .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 painting coatings.
- .2 evidence of poor coverage at fastener heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
- .3 damage due to touching before paint is sufficiently dry or other contributory cause.
- .4 damage due to application on moist surfaces or caused by inadequate protection from weather.
- .5 damage or contamination of paint due to blown contaminants (dust, spray paint, etc).

.3 Painted surfaces will be rejected 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.
- .2 visible defects are evident on horizontal surfaces when viewed at normal veiwing angles from distance of not less than 1000 mm.
- .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 Make Good rejected surfaces. Small affected areas may be touched up; large affected areas or areas without sufficient dry film thickness of paint shall be repainted. Runs, sags or damaged paint shall be removed by scraper or by sanding prior to application of paint.

3.6 ADJUSTING

.1 Following completion of painting and finishing operations, reinstall removed items.

.2 Remove protective covers and masking from protected surfaces.

.3 Repaint damaged surfaces to the satisfaction of the Consultant.

3.7 CLEANING

.1 Refer to Division 01.

.2 Remove paint where spilled, splashed, splattered or sprayed using means and materials that are not detrimental to affected surfaces.

.3 Keep work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

.4 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.

.5 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.

.6 Leave the Work clean and free from dirt and debris.

3.8 WASTE MANAGEMENT

.1 Paint, stain and wood preservative finishes and related materials (thinner, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Obtain information on these controls from the authorities having jurisdiction.

.2 Separate and recycle waste materials. Where paint recycling is available, collect waste paint by type and deliver to recycling or collection facility. Materials that cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

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

.4 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or in into the ground the following procedures shall be strictly adhered to:
- .1 Retain cleaning water for water-based materials to allow sediments to be filtered out. Do not clean equipment using free draining water.
- .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
- .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
- .5 Empty paint cans are to be dry prior to disposal or recycling.
- .6 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

.5 Set aside and protect surplus and uncontaminated finish materials not required by the Owner and deliver or arrange collection of verifiable re-use or re-manufacturing.

3.9 PROTECTION

.1 Refer to Division 01.

.2 Protect other surfaces from paint or damage.

.3 Repair damage.

3.10 FINISH SCHEDULE

.1 Provide the following paint or finish systems for the various substrates indicated, in accordance with the MPI Architectural Painting Specification Manual.

.2 Refinishing Existing, Previously Finished Surfaces:
- .1 Refer to MPI Maintenance Repainting Manual Section for refinishing existing finishes.
- .2 Use finish coat of respective new surface finish system for minor repair of existing finishes.
- .3 Use system primer where existing finishes are damaged down to bare surface.

.3 Interior Painting and Finishing Schedule
- .1 Concrete Vertical Surfaces
  - .1 Epoxy Finish: INT. 3.1G - EPOXY-MODIFIED LATEX (for smooth concrete), Premium Grade; Gloss Level G6.
  - .2 Opaque Painted Finish: INT. 3.1M - INSTITUTIONAL LOW ODOR / VOC, Premium Grade; Gloss Level G4.
- .2 Concrete Floors
  - .1 Opaque Painted Finish: INT. 3.2A - LATEX FLOOR ENAMEL, Premium Grade; Gloss Level MPI #60 Low Gloss.
- .3 Concrete Masonry Units
  - .1 Opaque Painted Finish: INT. 4.2E - INSTITUTIONAL LOW ODOR / VOC (over latex block filler), Premium Grade; Gloss Level G4.
  - .2 Epoxy Finish: INT. 4.2J - EPOXY-MODIFIED LATEX (over latex block filler) FOR DRY ENVIRONMENTS, Premium Grade; Gloss Level G6.
- .4 Structural Steel, Steel Joists, Steel Deck and Metal Fabrications
  - .1 Opaque Painted Finish - Overhead Applications: INT. 5.1C - W.B. DRY FALL (over q. d. alkyd primer), Premium Grade; Gloss Level G5.
  - .2 Opaque Painted Finish: INT. 5.1E - ALKYD (over q.d. alkyd primer), Premium Grade; Gloss Level G5.
  - .3 Epoxy Finish: INT. 5.1K - EPOXY-MODIFIED LATEX (over w.b. rust-inhibitive primer), Premium Grade; Gloss Level G6.
- .5 Galvanized and Galvannealed Metal
  - .1 Opaque Painted Finish: INT. 5.3N - INSTITUTIONAL LOW ODOR / VOC (over w. b. galvanized primer), Premium Grade; Gloss Level G5.
- .6 Dimension Lumber
  - .1 Semi-Transparent Stained Fire Retardant Finish: INT. 6.2FF - FIRE RETARDANT, PIGMENTED, W.B., Premium Grade; Gloss Level G4.
  - .2 Semi-Transparent Stained Finish: INT. 6.2J - POLYURETHANE VARNISH (over s.b. stain), Premium Grade; Gloss Level G4.
  - .3 Opaque Painted Finish: INT. 6.2L - INSTITUTIONAL LOW ODOR / VOC (over latex primer), Premium Grade; Gloss Level G5.
- .7 Dressed Lumber and Wood Doors
  - .1 Semi-Transparent Stained Finish: INT. 6.3EE - POLYURETHANE VARNISH (over w.b. stain), Premium Grade; Gloss Level G4.
  - .2 Semi-Transparent Stained Fire Retardant Finish: INT. 6.3RR - FIRE RETARDANT, PIGMENTED, W.B., Gloss Level G4.
  - .3 Opaque Painted Finish: INT. 6.3V - INSTITUTIONAL LOW ODOR / VOC (over latex primer), Premium Grade; Gloss Level G5.
- .8 Wood Floors
  - .1 Clear Finish: INT. 6.5M - POLYURETHANE, CLEAR, 2 COMPONENT, Premium Grade; Gloss Level G6.
- .9 Plaster and Gypsum Board
  - .1 Epoxy Finish: INT. 9.2F - EPOXY-MODIFIED LATEX (over latex primer/sealer), Premium Grade; Gloss Level G6.
  - .2 Opaque Painted Finish - Vertical Applications: INT. 9.2M - INSTITUTIONAL LOW ODOR / VOC (over latex primer/sealer), Premium Grade; Gloss Level G3.
  - .3 Opaque Painted Finish - Horizontal Applications: INT. 9.2M - INSTITUTIONAL LOW ODOR / VOC (over latex primer/sealer), Premium Grade; Gloss Level G1.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

.1 Aluminum Association Designation System for Aluminum Finishes.

.2 ASTM B221M-13: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

.3 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: illustrate materials, finishes, dimensions, locations, details of connections and fastening, elevations, sections, metal thicknesses, trim and hardware.

1.4 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Samples: a composite sample of a tackboard; 1000 x 1000 mm in size; illustrating the quality of each material, trim pieces, and the method of joining adjacent panels.

1.5 CLOSE-OUT SUBMITTALS

.1 Submit operation and maintenance data as specified in Division 01.

2 Products

2.1 MANUFACTURERS

.1 Manufacturer having Product considered acceptable for use:
.1 Architectural School Products, Ltd.

.2 Substitution Procedures: refer to Division 01.

2.2 DESCRIPTION

.1 Use only matching components from a single manufacturer's series.

2.3 REGULATORY REQUIREMENTS

.1 Conform to applicable codes and the Ontario Fire Marshal's Office.

.2 Test Products for fire performance to CAN/ULC S102.

2.4 COMPONENTS

.1 Tackboard: 13 mm thick; factory laminated; as follows:
.1 Tackable Surface: 6 mm thick linoleum cork, Krommenie by Forbo, colour as selected by Consultant.
.2 Back-up Panel: 6 mm thick particle board or Masonite substrate.

.2 Aluminum Trim: minimum 1.5 mm thick extruded aluminum, to ASTM B221M, 6063 alloy, T5 temper; as follows:
  .1 Perimeter Trim: extruded aluminum trim for tackboards; ASP No. 205 by Architectural School Products, Ltd.
  .2 Divider / Joiner Trim: extruded aluminum trim for adjacent tackboard panels of elevations greater than 2440 mm; ASP No. 207 by Architectural School Products, Ltd.

2.5 FABRICATION

.1 Factory laminate tackable surface to back-up panel under mechanical pressure, using a waterproof adhesive.

2.6 FINISHES

.1 Aluminum: clear etched and anodized 0.051 mm satin finish, free from extruding draw marks and surface scratches; to Aluminum Association AA-A41.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Verify millwork units designated to incorporate visual display surfaces are installed.

3.2 INSTALLATION

.1 Install components to ensure a rigid, straight, square, plumb installation with horizontal lines level.

.2 Securely attach aluminum trims to ensure that fastenings are concealed.

.3 Adhere tackboards to wall surface with an approved adhesive in egg-size blobs at approximately 200 mm OC. Press tackboards firmly into adhesive, ensuring proper adhesion.

3.3 ADJUSTING

.1 Leave Products in a state suitable for immediate use by Owner.

3.4 CLEANING

.1 Refer to Division 01.

.2 Clean down, remove dirt and leave elements in a first class condition.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 05 50 00 - Metal Fabrications.

.3 Section 08 14 00 - Wood Doors.

.4 Section 09 21 16 - Gypsum Board Assemblies.

1.2 ALLOWANCES

.1 The Contract Price includes a stipulated sum cash Allowance as specified in Section 01 21 01.

.2 Cash Allowance: includes the supply and installation of signage.

1.3 REFERENCES

.1 University of Guelph Design Standard RD-04: Signage.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate sizes, thicknesses, styles, font styles and sizes, braille, finishes, methods of attachment, mounting heights, and special details.

1.5 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Verification Samples: one full size sample of each sign type, illustrating size, thickness, method of attachment, font style and size, braille, and finish.

1.6 CLOSEOUT SUBMITTALS

.1 Submit installation and maintenance data for signage as specified in Division 01.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Nothers Signs & Recognition.

.2 Substitution Procedures: refer to Division 01.

2.2 DESCRIPTION

.1 Typography: in accordance with University of Guelph Design Standard RD-04, as follows:
.1 Primary Typeface: Helvetica.
.2 Complimentary Typeface: Bembo.

.2 Colours: in accordance with University of Guelph Design Standard RD-04.

.3 Braille: Grade 2 alphabet to AODA requirements, raised disc type, lowercase except for proper names, and letters which are part of a room designation.

2.3 MATERIALS

.1 Sign Plates: Vista by Nothers Signs & Recognition; colours, sizes and styles as set out in the University of Guelph Design Standard RD-04, and as indicated on the Drawings.

.2 Fasteners: concealed type, as recommended by sign manufacturer for intended substrate.

.3 Adhesive: as recommended by sign manufacturer for intended substrate.

2.4 FABRICATION

.1 Fabricate signs in accordance with University of Guelph Design Standard RD-04, to designs indicated on the Drawings.

.2 Install braille immediately below the corresponding text. Where text is multi-lined, place Braille below entire text.

.3 Locate Braille 6 mm away from any other tactile characters.

3 Execution

3.1 INSTALLATION

.1 Install signs straight, plumb, level and secured in a manner to prevent distortion or displacement.

.2 Install signs at designated mounting heights, in accordance with the University of Guelph Design Standard RD-04.

.3 Completed installation shall be free of defects, warping, open seams, and rattles.

.4 Replace Products that are bent, scratched or damaged.

.5 Provide concealed fasteners to the full required complement, properly tightened, and in accordance with accepted Shop Drawings.

3.2 PROTECTION

.1 Refer to Division 01.

.2 Protect installed Products with temporary removable film until Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 05 50 00 - Metal Fabrications.

.3 Section 06 24 00 - High Pressure Decorative Laminate.

.4 Section 09 21 16 - Gypsum Board Assemblies.

.5 Section 10 28 13 - Toilet Accessories.

1.2 REFERENCES

.1 ANSI A208.1-2009: Particleboard.

.2 ASTM A240/A240M-16: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.3 ASTM B456-11e1: Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: indicating panel construction, hardware, and accessories.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: compartment plan and elevation views, with details indicating internal reinforcement, dimensions, supports, and door swings. Coordinate support details with Section 05 50 00.

1.5 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: duplicate chain sets of available HPDL colours, patterns and textures, for selection by Consultant.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 ASI Group Global.
.2 Bobrick.
.3 CDA Industries Inc.
.4 Decolam.
.5 Shanahan's.

.2 Substitution Procedures: refer to Division 01.

2.2 DESCRIPTION

.1 Toilet Compartments: HPDL-faced phenolic core doors, panels and pilasters, ceiling-suspended design.

2.3 MATERIALS

.1 High Pressure Decorative Laminate (HPDL): standard decorative laminate, as specified in Section 06 24 00; colours and patterns as selected by Consultant.

.2 Phenolic Cores: single component, solid phenolic polymer resin; formed under high pressure; Black colour.

.3 Stainless Steel Sheet: to ASTM A240/A240M, Type 304.

.4 Chromed Steel Sheet: to ASTM B456.

.5 Attachments, Screws, and Bolts: Stainless steel; tamper proof type; heavy duty extruded aluminum brackets.

2.4 COMPONENTS

.1 Doors - Regular Stalls: 610 x 1,473 mm size; 19 mm thick, HPDL faces pressure bonded to solid phenolic core; exposed phenolic edges.

.2 Doors - Barrier Free Stalls: 860 x 1,473 mm size; 19 mm thick, HPDL faces pressure bonded to solid phenolic core; exposed phenolic edges.

.3 Panels: 1,473 mm high, width to suit application; 13 mm thick, HPDL faces pressure bonded to solid phenolic core; exposed phenolic edges.

.4 Pilasters: width to suit application; 19 mm thick, HPDL faces pressure bonded to solid phenolic core; exposed phenolic edges.

.5 Pilaster Shoes: 75 mm high, formed stainless steel.

.6 Splash Plates: 760 mm wide, 1,066 mm high; 1.2 mm thick stainless steel sheet; rounded corners; for screw fastener application.

.7 Hinges: Chrome plated non-ferrous cast pivot hinges, gravity type, adjustable for door close positioning; complete with nylon bearings.

.8 Latch: Chrome plated non-ferrous slide bolt with combination door stop and keeper with rubber bumper.

.9 Privacy Astragal: chrome plated non-ferrous privacy astragal.

.10 Door Pull: Chrome plated cast zinc alloy handle; through-door fastening.

.11 Brackets: heavy duty extruded aluminum alloy, brightened and polished.

.12 Door Bumper: chrome plated non-ferrous casting with rubber shock absorbing bumper insert.

2.5 FABRICATION

.1 Bond HPDL faces to cores using approved adhesive. Conform to Section 06 24 00.

.2 Mount brackets and reinforcements securely to panels.

.3 Fabricate barrier-free stall doors to swing out.

2.6 FINISHES

.1 Stainless Steel: to ASTM A240/A240M, No. 4 - Brushed.

.2 Chrome/Nickel Plating on Metal Components: to ASTM B456, Type SC 2; Polished finish.

3 Execution

3.1 INSTALLATION

.1 Install partitions securely, straight, plumb, and level.

.2 Attach panel brackets securely to walls using anchor devices.

.3 Install splash panels on partitions adjacent to urinals. Fasten with stainless steel screws spaced 20 mm OC.

.4 Anchor urinal screen panels to walls with two panel brackets and vertical upright consisting of pilaster rigidly anchored to ceiling supports.

.5 Support pilasters from built-in framing using two adjustable hanging studs providing vertical levelling. Conceal ceiling fastenings with pilaster shoe.

.6 Equip each door with two hinges, privacy astragals, one door latch, and one door bumper.

.7 Equip out-swinging doors with two door pulls, mounted one on each side.

3.2 ADJUSTING

.1 Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 5 mm.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 05 50 00 - Metal Fabrications.

.2 Section 09 21 16 - Gypsum Board Assemblies.

.3 Section 09 51 23 - Acoustical Tile Ceilings.

.4 Section 10 22 26.53 - Vertically-Folding Operable Partitions.

1.2 ALTERNATIVES

.1 Submit Alternate Prices as specified in Division 00.

.2 Alternate Price:
.1 Base Bid: vertically-folding operable partition as specified in Section 10 22 26.53.
.2 Alternative: horizontally-folding operable partition as specified herein.

1.3 REFERENCES

.1 ASTM E84-16: Standard Test Method for Surface Burning Characteristics of Building Materials.

.2 ASTM E90-09: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.3 ASTM E557-12: Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions.

.4 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: Describe partition operation, hardware and accessories, electric operating components, track switching components, colours and finishes available.

1.5 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, track switches, track loads, adjacent construction and finish trim, and stacking sizes.

1.6 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Verification Samples: duplicate 300 x 300 mm size samples, illustrating surface finish, quality, colour, texture, and weight.

1.7 WARRANTY

.1 Submit an extended warranty in accordance with the General Conditions of the Contract.

.2 Extended Warranty: manufacturer's standard 5 year extended warranty, covering against manufacturing defects.

2 Products

2.1 MANUFACTURERS

.1 Manufacturer having Product considered acceptable for use:
.1 Moderco, Inc.

.2 Substitution Procedures: refer to Division 01.

2.2 REGULATORY REQUIREMENTS

.1 Conform to applicable codes for combustibility requirements for materials.

2.3 PERFORMANCE CRITERIA

.1 Sound Transmission Coefficient: to ASTM E90, STC=47.

.2 Surface Burning of Vinyl Fabric: Class A to ASTM E84 and CAN/ULC S102; as follows:
.1 Flame Spread: 25.
.2 Fuel Contributed: 35.
.3 Smoke Developed: 50.

.3 Install partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.

2.4 MANUFACTURED UNITS

.1 Horizontally-Folding Operable Partition: manually-operated, horizontally-folding, paired panel operable partition, top-supported from aluminum track for centre-stacked configuration, complete with top and bottom retractable seals, tongue and groove vertical aluminum astragals, with a single trolley assembly per panel, and vinyl finish both sides; Signature 8500 by Moderco, Inc.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Confirm track supports are laterally braced and will permit track to be level within 6 mm of required position and parallel to the floor surface.

.3 Confirm floor flatness of 3 mm per 3 metres, non-cumulative.

3.2 PREPARATION

.1 Prepare opening to ASTM E557.

3.3 INSTALLATION

.1 Install Products to ASTM E557.

.2 Fit and align partition assembly level and plumb.

.3 Provide lateral restraint to secure partition panels to floor when in closed position. Partition can not move as a result of lateral impacts or applied forces.

3.4 ADJUSTING

.1 Adjust partition assembly to provide smooth operation from stacked to drawn position.

3.5 CLEANING

.1 Refer to Division 01.

.2 Clean finish surfaces and partition accessories.

3.6 DEMONSTRATION

.1 Conduct training and demonstration as specified in Division 01.

.2 Demonstration: demonstrate operation and maintenance procedures for operable partitions.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 09 21 16 - Gypsum Board Assemblies.

.3 Section 09 51 23 - Acoustical Tile Ceilings.

.4 Section 10 22 26 - Operable Partitions.

.5 Section 26 05 00 - Common Work Results for Electrical.

1.2 ALTERNATIVES

.1 Submit Alternate Prices as specified in Division 00.

.2 Alternate Price:
.1 Base Bid: vertically-folding operable partition as specified herein.
.2 Alternative: horizontally-folding operable partition as specified in Section 10 22 26.

1.3 REFERENCES

.1 ASTM E84-16: Standard Test Method for Surface Burning Characteristics of Building Materials.

.2 ASTM E90-09: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.3 ASTM E557-12: Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions.

.4 CAN/ULC S102-10: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: Describe partition operation, hardware and accessories, track switching components, colours and finishes available.

1.5 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, track switches, track loads, adjacent construction and finish trim, and ceiling storage pocket sizes.

1.6 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: duplicate 300 x 300 mm size samples of available surface finishes, illustrating quality, colour, texture, and weight.

1.7 WARRANTY

.1 Submit an extended system warranty in accordance with the Contract.

.2 System Warranty: covering against defective material and workmanship for a period of 2 years from the date of Substantial Performance of the Work.

2 Products

2.1 MANUFACTURERS

.1 Manufacturer having Product considered acceptable for use:
.1 Skyfold Inc.

.2 Substitution Procedures: refer to Division 01.

2.2 DESCRIPTION

.1 Automatic Vertically Folding Acoustical Wall: acoustical partitions that, when in the down position (closed) are hard, rigid, flat, plumb walls, made of a grid of rectangular acoustical panels, and when are lifted (opened), fold upward (vertically) without the use of any manual labour, in a manner similar to an accordion, into a pocket in the ceiling, between roof joists, or up between built in bulkheads. In the down (closed) position, the wall shall be comprised of two vertical planes of acoustical panels, separated by an acoustical air space.

.2 The operable wall shall open and close in a manner similar to an accordion, in that all wall panels fold and unfold at the exact same time, at the exact same rate. Walls that rely on the sequential folding of acoustical panels, or acoustical panel sets are not acceptable.

.3 Motor Assembly: motor drive assembly mounted directly above the centre line of the operable wall. The required distance depends upon the height of the wall. Support steel required at one location.

2.3 REGULATORY REQUIREMENTS

.1 Conform to applicable codes for combustibility requirements for materials.

2.4 PERFORMANCE CRITERIA

.1 The operable wall shall be opened and closed using two push button switches wired in series with power controlled by a single, 3-position key switch. Turning the key from the “off” position shall cause the wall to move in the designated direction “up” or “down” once both push buttons are depressed. When hand pressure is removed, the wall shall immediately stop. The operable wall shall stop in a quick and positive fashion without coasting. As a normal part of the operation, it shall be possible to partially open (or close) the wall, stop it and then reverse the operation. There shall be 2 switches per operable wall, located on opposite sides of the wall at opposite ends of the wall, wired in series. One switch shall be equipped with an LED that flashes fault codes in case of a failure with the electrical system.

.2 From a fully open position, the wall shall be able to go through its entire cycle of closing and opening without any manual intervention.

.3 When the operable wall is being lowered (closed) it shall come automatically to rest once it has reached the fully down (closed) position.

.4 When the operable wall is being lifted (opened) it shall come automatically to rest once it has reached the fully up (open) position.

.5 The operable wall shall automatically and acoustically seal against the floor without the need for any manual intervention. The floor seals shall leave a joint between the floor and the bottom acoustical panels of not more than approximately 50 mm.

.6 The operable wall shall automatically and acoustically seal against the two end walls without the need of any manual intervention. The end seals shall act in such a way as not to come into contact with the end walls while the operable wall is in motion. The end seals shall leave a joint between the acoustical panels and the end walls of no more than approximately 25 mm. Seals that rub or brush against the end walls are not acceptable. Once the wall reaches the fully down position, the end seals shall activate automatically. The key switch must be held for the duration of the operation.

.7 The operable wall shall automatically and acoustically seal against the ceiling without any manual intervention. The top seals shall leave a joint between the top acoustical panels and the ceiling of the pocket of not more than approximately 50 mm.

.8 The operable wall shall open and close at a constant nominal speed of approximately 1.5 to 3 metres per minute.

.9 When the operable wall is being lowered (closed), it shall stop if the leading (bottom) edge comes into firm contact with any object between it and the floor. The operable wall will then automatically reverse its direction and ascend for approximately 3 seconds to clear the object. The regular operation of the wall can resume once the obstruction has been removed.

.10 The operable wall shall be visibly flat and rigid in the down (closed) position.

.11 There shall be no exposed hinges, brackets, screws, and no part of the mechanical system shall be visible when the operable wall is in the down (closed) position.

.12 All of the panel edges shall be right angled, with a minimum radius not more than 1.6 mm.

.13 All of the panels shall be rectangular, nominally of the same size, unless requested otherwise by the Consultant.

.14 Joints between panel, vertical and horizontal, shall be no more than approximately 13 mm wide.

.15 The operable wall shall stack in the up (open) position into a space no greater than 1 650 mm wide. The operable wall shall have a stacking height ratio in the range of 1:5 to 1:10, depending on the height of the wall.

.16 Each acoustical panel shall be individually removable using only a screw driver. No special tools or equipment shall be required. The removal of a single acoustical panel shall not affect, dislocate or cause the removal of any adjacent panels or other acoustical panels.

.17 The operable wall shall be mechanically operable with a few of the acoustical panels removed from one, or both sides of the operable wall.

.18 The operable wall shall not weigh more than 41.1 kg/m^2, not including the motor drive or the the architectural finish on the acoustical panels.

.19 Sound Transmission Class (ASTM E90): System STC = 60, Panel construction STC = 66.

.20 Design operable wall to have a design life of at least 10,000 complete closed to opened to closed cycles.

2.5 MANUFACTURED UNITS

.1 Operable Wall: automatic vertically-acting retractable acoustic wall; Zenith 60 by Skyfold Inc.

2.6 COMPONENTS

.1 Acoustical Panels: Steel faced; filled mineral fibre acoustic batt insulation; architecturally flat with no bowing, oil canning, warping, waviness or any other surface deformation and discontinuity; one panel side finished with Lampre Laminate marking steel, and the other panel side finished with Maple veneer with Random match grain and shop-applied transparent finish.

.2 Folding Mechanism: structural grade aluminum extrusions and structural shapes; with bushings, spacers, pins, discs, bearings, sleeves designed to function quietly and with minimum wear, over the 10,000 cycle design life of the operable wall; steel hangers welded or bolted to support steel.

.3 Motor Drive: sized properly to open and close effectively over 10,000 cycles at the specified design speed; smooth, quiet operation; ball bearing construction where possible; chain or belt drive systems not accepted; use the latest in industry standards in thermal protection, overload protection, quick acting fuses, etc., in order to ensure the safety and reliability of the system.
- .1 Cable: 6 x 31 stainless steel aircraft cable; sized to hold entire weight of wall, with the appropriate safety factor; winding and unwinding on its own cable drum.
- .2 Cable Drum: yoyo drum of sufficient size to accommodate two cable safety wraps and multiple layers of cable.
- .3 Line Shaft: sized to deliver the required torque with minimum deflection and to support and rotate the cable drums; connected directly to the power drive through properly sized, load rated couplings, keyed to the line shaft.
- .4 Flange Bearings: appropriate size to support the line shaft and located immediately on both sides of the drum assembly.
- .5 Power Drive: sized to deliver sufficient amount of torque to safely and effectively raise and lower the operable wall over its design life.

.4 Safety Equipment:
- .1 Electromagnetic type brake which will activate firmly, without hesitation, when power is lost to the system; minimum retarding torque rating equal to 200 percent of the power drive full load torque; complete with manual break release lever.
- .2 Dynamic Brake: distinct and separate from electromagnetic brake; to completely halt the downward motion of the wall in the case of a catastrophic failure in the power train.
- .3 Provide electrical or other limit switches in order to stop the wall at its up and down travel limits.
- .4 Provide a mechanical over torque detector in order to sense a jam in the system and to act as an over travel limit in the up direction should the primary limit switch fail to act; using motor's torque arm in over torque detection.
- .5 Provide a continuous pressure sensing strip which shall cut power to the lifting equipment and shall activate the electromagnetic brake if the sensing edge comes in firm contact with an object, before the wall is in the full down (closed) position. The power shall remain cut to the motor drive until the switches have been released. The operation of the operable wall can resume once the obstruction is removed.

.5 Electrical
- .1 Equip operable wall for a 3-phase power supply to a NEMA 1 electrical control box.
- .2 Coordinate low voltage wiring with Division 26.
- .3 Switches: two push button switches wired in series with power controlled by a single, 3-position key switch. One push button switch to include an LED that flashes fault codes in case of an electrical system failure.

3 Execution

3.1 EXAMINATION

.1 Refer to Division 01.

.2 Confirm track supports are laterally braced and will permit track to be level within 6 mm of required position and parallel to the floor surface.

.3 Confirm floor flatness of 3 mm in 3 metres, non-cumulative.

3.2 PREPARATION

.1 Prepare opening to ASTM E557.

3.3 INSTALLATION

.1 Install partition to ASTM E557.

.2 Fit and align partition assembly level and plumb.

.3 Install electric operator, wiring, and controls for electrically operated partitions.

.4 Locate control stations as directed by Consultant.

.5 Coordinate installation of electric service.

.6 Install partition system for long life under hard use.

3.4 ADJUSTING

.1 Adjust partition assembly to provide smooth operation from closed to open to closed position.

3.5 CLEANING

.1 Refer to Division 01.

.2 Clean finish surfaces and partition accessories.

3.6 DEMONSTRATION

.1 Conduct training and demonstration as specified in Division 01.

.2 Demonstration: demonstrate operation and maintenance procedures for operable partitions.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 08 80 00 - Glazing.

.3 Section 09 21 16 - Gypsum Board Assemblies.

.4 Section 09 30 00 - Tiling.

.5 Section 10 14 00 - Signage.

.6 Section 10 21 13.19 - Plastic Toilet Compartments.

1.2 REFERENCES

.1 ASTM A123/A123M-15: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A153/A153M-16: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.3 ASTM A240/A240M-16: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.4 ASTM A269/A269M-15a: Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.5 ASTM A1008/A1008M-15: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

.6 ASTM B456-11e1: Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: describing size, finish, details of function, and attachment methods.

1.4 SAMPLES

.1 Submit samples as specified in Division 01.

.2 Selection Samples: duplicate 300 x 300 mm size, illustrating colour and finish.

1.5 OPERATION AND MAINTENANCE DATA

.1 Submit operation and maintenance data as specified in Division 01.

1.6 TOOLS

.1 Submit tools as specified in Division 01.

.2 Tools: minimum two keys for each accessory, master keyed.

2 Products

2.1 OWNER-FURNISHED PRODUCTS

.1 Owner-Furnished Products (OFP) means a Product that will be supplied by the Owner to the Contractor for installation as part of the Work.

.2 Schedule of Owner-Furnished Products:
.1 Toilet tissue dispensers.
.2 Soap dispensers.
.3 Hand dryers.
.4 Waste receptacle.
.5 Sanitary napkin Sani-Pod disposal units.
.6 Hand sanitizer dispensers.

2.2 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Frost Products Limited.

.2 Substitution Procedures: refer to Division 01.

2.3 MATERIALS

.1 Sheet Steel: to ASTM A1008/A1008M.

.2 Stainless Steel Plate, Strip and Sheet: to ASTM A240/A240M, Type 304.

.3 Stainless Steel Tubing: to ASTM A269/A269M, Grade TP316.

.4 Mirror Glass: as specified in Section 08 80 00.

.5 Adhesive: Two-component epoxy type, waterproof.

.6 Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.

.7 Expansion Shields: Fibre, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.4 MANUFACTURED UNITS

.1 Waste Receptacle: free-standing type, 350 mm wide, 374 mm deep, 845 mm high; 80 litre capacity, stainless steel construction with no openings on sides and bottom, tight sealing head and spring loaded door, complete with bag holder apparatus; Code 301-NLS by Frost Products Ltd.

.2 Grab Bars: 38 mm OD, 1.2 mm thick stainless steel tubing; peened non-slip finish; round or oval concealed flange attachments, straight and L-shaped configurations in sizes indicated on Drawings.

.3 Toilet Backrest: 32 mm OD stainless steel tubing having minimum 1.6 mm thick walls; with 16 mm thick, 255 x 102 mm size solid plastic laminate panel; concealed mounting with flange attachments, spaced at 305 mm OC; 200 mm extension from wall face; Code 1028 by Frost Products Ltd.

.4 Framed Mirror: 610 x 915 mm size, one piece stainless steel frame with mitred corners and bright annealed finish; vandal-resistant three-way mounting; 4 mm thick mirrored glass with shock resistant primary back and fully galvanized back panel; Code 941-2436 by Frost Products Ltd.

.5 Stainless Steel Shelf: 460 mm long, 140 mm deep, 102 mm high; 0.76 mm thick stainless steel with rounded corners, surface mounted; Code 950-18 by Frost Products Ltd.

.6 Janitorial Towel Dispenser: 267 x 241 mm size; 170 mm deep; surface mounted; piano hinged top; combination finger pull and level indicator; serrated safety cutting edge; Code 103 by Frost Products Ltd.

.7 Janitorial Utility Shelf: 1.2 mm thick stainless steel, 914 x 203 mm size, surface mounted; complete with 3 mop / broom holders, 2 pail hooks and an 8 mm OD chrome plated drying rod; Code 1115 by Frost Products Ltd.

2.5 FABRICATION

.1 Weld and grind smooth, joints of fabricated components.

.2 Use mechanical fasteners only where approved.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes to prevent electrolysis.

.6 Hot dip galvanize concealed ferrous metal anchors and fastening devices.

.7 Shop assemble components and package complete with anchors and fittings.

.8 Do not apply manufacturer's or brand names on face of units.

2.6 FINISHES

.1 Galvanized Coating on Steel Components: hot dipped zinc coating, to ASTM A123/A123M, Z275 coating designation.

.2 Galvanized Coating on Steel Hardware: hot dipped zinc coating, to ASTM A153/A153M, Class B2.

.3 Shop Primed Coating on Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.

.4 Baked Enamel Coating on Steel Components: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

.5 Chrome/Nickel Plating on Metal Components: to ASTM B456, Type SC 2; Polished.

.6 Stainless Steel: to ASTM A240/A240M and ASTM A269/A269M; No. 4 - Brushed.

3 Execution

3.1 PREPARATION

.1 Provide templates and rough-in measurements as required.

3.2 INSTALLATION

.1 Install Products and Owner-Furnished Products rigidly in place using tamper-proof fasteners, as follows:
  .1 Stud Walls: install steel back plate to stud prior to application of wall board. Provide plate with threaded studs or plugs.
  .2 Hollow Masonry Units, Existing Plaster or Gypsum Board: use toggle bolts drilled into cell or wall cavity.
  .3 Solid Masonry or Concrete: use bolt with lead expansion sleeve set into drilled hole.
  .4 Grab Bars: use built-in anchors.
  .5 Toilet Compartments: use male-female through bolts.

.2 Set square items plumb.

.3 Install mirrors on concealed wall hangers, and secure in place with theft-proof locking screws.

3.3 PROTECTION

.1 Refer to Division 01.

.2 Protect Product surfaces with removable protective film until Owner occupancy.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 00 00 - Masonry.

.2 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

.1 AAMA 611-12: Voluntary Specification for Anodized Architectural Aluminum.

.2 ASTM B221M-13: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

.3 CAN/ULC S109-03: Flame Tests of Flame Resistant Fabrics and Films.

.4 NFPA 701-2004: Methods of Fire Tests for Flame Propogation of Textiles and Films.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Division 01.

.2 Product Data: indicating materials, finishes, construction and installation instructions.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Division 01.

.2 Shop Drawings: indicating sizes, fasteners, installation methods and clearance at head, jamb and sill for each mounting condition.

1.5 QUALIFICATIONS

.1 Supplier: manufacturer-certified firm, approved to supply the specified Products and to honour warranty claims.

.2 Installer: certified by manufacturer as trained and experienced in the installation of the specified Products.

1.6 WARRANTY

.1 Submit an extended warranty in accordance with the General Conditions of the Contract.

.2 Extended Warranty: manufacturer's standard 8 year written limited warranty against defects in material and workmanship.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
- .1 Concord Shading Systems Inc.
- .2 Hunter Douglas.
- .3 Levolor.
- .4 MechoShade Systems, Inc.
- .5 Nysan Shading Systems Ltd.
- .6 Solarfective.
- .7 Sun Glow Window Covering Products of Canada Ltd.
- .8 Sun Project of Canada Inc.

.2 Substitution Procedures: refer to Division 01.

2.2 DESCRIPTION

.1 Interior Shades: manually operated, chain and sprocket roller shade system, with infinite positioning; each shade unit consisting of two end brackets, shade tube, fascia, hembar and fabric.

2.3 MATERIALS

.1 Extruded Aluminum: to ASTM B221M, 6063 alloy, T5 temper; unless specified otherwise.

.2 Plastic: ABS type.

.3 Sun Control Fabric: woven of 0.18 opaque, vinyl coated polyester yarn consisting of approximately 79% vinyl and 21% 500 dernier polyester core yarn; tensioned prior to heat setting; to NFPA 701 and CAN/ULC S109; Grey colour; 3 percent openess.

.4 Bituminous Coating: fibrous asphalt emulsion.

.5 Screw Fasteners: non-corrosive type, size as recommended by shade manufacturer.

2.4 COMPONENTS

.1 End Bracket: 77 x 96 mm, two-piece moulded ABS construction; 64 mm OD nylon drive sprocket; colour to match fascia colour.

.2 Shade Tube: 1.52 mm thick extruded aluminum with three internal continuous fins 4.82 mm high spaced 120 degrees apart.

.3 Fascia: 1.7 mm thick extruded aluminum complete with three continuous screw flute, anodized finish.

.4 Drive Assembly: factory set for size and travel of shades, field adjustable; complete with built-in shock absorber designed to prevent chain breakage.

.5 Drive Chain: No. 10 stainless steel bead chain, continuous loop type, tested for 41 Kg of force.

.6 Exterior Hembar: extruded aluminum with plastic end finials; anodized finish.

2.5 FINISHES

.1 Anodized Coating on Aluminum: to AAMA 611, AA-M12C22A31, Class II Clear Anodic Oxide treatment, No. 17.

3 Execution

3.1 PREPARATION

.1 Apply a heavy coat of bituminous paint on aluminum surfaces placed in direct contact with concrete, mortar, plaster, or dissimilar metals.

.2 Provide fastenings and anchors required to be built in to adjacent work to other Sections.

3.2 INSTALLATION

.1 Install Products in window openings level, plumb, square, rigidly coupled and adequately anchored, maintaining uniform clearances, accurate alignment levels, and parallel with window plane.

.2 Secure to substrate with recommended fasteners at minimum 610 mm OC.

.3 Conform to manufacturer’s Product data and accepted Shop Drawings.

.4 Conceal brackets and rollers with closure panels for full width of opening.

3.3 ADJUSTING

.1 Adjust Products to ensure smooth and trouble free operation without binding.

.2 Adjust shade and fabric to hang flat without buckling or distortion.

END OF SECTION