TECHNICAL SPECIFICATIONS FOR:

PROJECT:

Cathedral of St. Catherine of Alexandria: Columbarium Renovation

67 Church Street, St. Catharines, Ontario L2R 5M8

CLIENT: ROMAN CATHOLIC DIOCESE OF ST. CATHARINES
Mailing Address: P.O. Box 875, St. Catharines, Ontario, L2R 6Z4
Location: 3400 Merrittville Highway, Thorold, Ontario L2V 4V6

PROJECT No.: 2019-04

DATE: DECEMBER 8, 2021 ISSUED FOR TENDER

ARCHITECT:

GRGURIC ARCHITECTS INCORPORATED

28 King Street East, Unit B Stoney Creek ON L8G 1J8
Tel: 905-664-8735 Fax: 905-664-8737
Email: office @2gai.com Website: www.2gai.com

STRUCTURAL ENGINEERS:

DFE
DOYTCH & FILO ENGINEERING INC.
Structural Engineers

5063 North Service Road, Suite 200, Burlington, ON, L7L 5H6
Phone: 905-719-1482; 647-836-4805
www.doytchandfilo.com

MECHANICAL AND ELECTRICAL ENGINEERS:

CK ENGINEERING INC

3390 South Service Road, Suite 302
Burlington, ON L7N 3J5
Office: 905-631-1115
www.ckengs.com

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End of Section

1. Name of General Contractor

1. Name: _____
2. Address: _____
3. Phone: _____

2. Name of Project

Cathedral of St. Catherine of Alexandria: Columbarium Renovation
67 Church Street. St. Catharines, Ontario L2R 5M8

3. Addressed to Owner

THE ROMAN CATHOLIC DIOCESE OF ST. CATHARINES
c/o Grguric Architects Incorporated
28 King Street East, Unit B
Stoney Creek, ON L8G 1J8

4. Tender Amount

We, the undersigned General Contractors, having visited the Site and examined all conditions affecting the work, propose to furnish all materials, labour and equipment required to construct project according to all Contract Documents including addenda numbered ____ to ____ for the stipulated price of:

General Trades: _____

Mechanical: _____

Electrical: _____

CONTRACT PRICE _____

The Contract Price includes all applicable taxes and duties but excludes the H.S.T. This price will remain in effect for a period of ninety (90) days after Tender Closing.

Signed by _____

Signature of Authorized Officer of Company _____

_____ _____
Company Seal Witness signed

Dated at _____ on _____, 2022

5. Cash Allowance and Contingency Allowance

The Stipulated Sum includes the Cash Allowance and Contingency Allowance specified in Section 01020.

6. Bonds

Bonding not required.

7. Construction Schedule

Should this tender be accepted on or prior to January 30, 2022, the contract will be substantially performed no later than August 1, 2022, and the contract will be completed no later than August 30, 2022.

8. Proposed Subcontractors

.1 The following is my List of Subcontractors:

EXCAVATION & BACKFILL _____

MASONRY _____

CONCRETE _____

MISCELLANEOUS METAL _____

STRUCTURAL STEEL _____

CAULKING AND SEALING _____

DOORS AND FRAMES _____

DRYWALL _____

PORCELAIN TILE _____

PAINTING _____

MECHANICAL _____

ELECTRICAL _____

End of Tender Form

1. Tenders

1. Sealed Tenders are invited for the supply of all labour, materials, equipment and service to complete the above noted project, in accordance with the Drawings and Specifications as prepared by Architect.

2. Tenders for the work will only be accepted on the special forms provided for this purpose. Tenderers must fill in duplicate the copies provided, retain one (1) copy for his own record and enclose and seal the other copy in an envelope.

3. In the receipt of Tenders for the work, no obligation is incurred to accept the lowest or any proposal. The Owner reserves the right to refuse any of all Tenders for any subdivision of the work. Each Bid must be construed to cover all of the work of the trade bid, for notwithstanding the fact, that the Bid in recapitulating the same may omit some parts.

4. The Owner reserves the power and right to reject Tenders received from parties who cannot show a reasonable acquaintance with, and preparation for the proper performance of the class of work herein specified and shown on the drawings. Evidence of such competency must be furnished by the Tenderers when requested to do so.

5. Tenders containing escalation clauses will not be considered.

6. Tenderers must furnish all information requested on the Tender Form and should any uncertainty arise as to the proper manner of completing the Form, the Architect will give the requisite information. Tender Forms must be completed in a legible manner without alterations or erasures. Incomplete Tenders will not be considered.

7. Tenders must remain open for acceptance for a period of ninety (90) days and until a formal Contract and Bond for the work is executed by the successful Tenderer, as approved by the Owner.

8. Incorporated Companies must attach Corporate Seal, and Signatures of proper Officers must be affixed.

9. **Existing Building and Site:**

   .1 The existing Building and portions of the site will be occupied during construction.

   .2 All work renovation work is not to interfere with the daily access and function of the existing building.

   .3 All areas within the existing building must remain usable for their purpose during construction.

   .4 All dispositions shall be taken to prevent dust, noise and any disturbance to the existing building operation.

2. Tender Closing Date

Tenders for the work must be delivered to:
Grguric Architects Incorporated
28 King Street East, Unit B
Stoney Creek, Ontario L8G 1J8

Not later than 2:00:00 pm local time, Thursday, January 13, 2022.

3. Bond

1. Bonding not required.

4. Subcontractor

1. The Bidder must be responsible that all materials and labour called for in the Specifications and Drawings (and any Addenda or changes thereto) are included in the Tender. The Tenderer to state the names of all subcontractors and manufacturers as called for on the Tender Form. The List of Subcontractors and manufacturers set forth **are not to be altered or changed,** except as may be directed by the Architect who may require that an alternative subcontractor be employed at the time of the signing of the Contract, provided that the necessary adjustment is made to the Contract Amount.

5. Contract

1. The successful Bidder is required to execute the formal contract, revised to include amendments thereto, as set out in the Amendments to General Conditions.

6. Completion Date

1. The work is to be carried to completion as rapidly as possible, consistent with good building practice and reasonable economy ready for the Owner's full occupancy in the time stated in the Tender.

2. The term "Completion" is understood to mean that the work of the Contract has been completed, including all items of the Architect's Deficiency List, to the Architect's satisfaction and the work accepted by the Owner.

7. Sales Taxes

1. The Tender Amount shall include all Provincial Sales Taxes, Excise Taxes and Government Duties on all materials required for the completion of the work of the Contract, provided that same are in force at the time of Contract signing, but excludes the H.S.T.

2. In the event of a change being made in the amount of taxes or duties, after the execution of the Contract, the amount of the Contract will be adjusted either more or less in conformity with the changes.

8. Drawings & Specifications

1. The drawings hereinafter referred to will be those listed in this Specification, together with such other working drawings as may be issued by the Architect during the progress of the work.

2. Tenderers must examine the Architectural and Structural, Mechanical and Electrical Drawings and Specifications, and fully inform themselves regarding the requirements, conditions and limitations pertaining to the work of the Contract, and include and allow for accordingly in the preparation of their Tender.

3. Tenderers must check the set of Drawings and Specifications issued to them for Tendering purposes to ensure that they are complete and all drawings are included, as listed in the List of Drawings, and all Trades and Pages are included in the Specifications, as listed in the Index.

9. Questions Re: Drawings & Specifications

Tenderers finding discrepancies in, or omissions from the Drawings and Specifications, or in doubt as to the meaning and intent of any part thereof, may submit questions for clarification to the Architect only through the General Contractors selected to bid on this project. Phone calls will not be entertained. If necessary, written instructions or explanations in the form of Addenda will be sent by the Architect to all General Contractors tendering. The Architect must receive questions not less than three (3) days before date set for receipt of Tenders.

Submit questions by email to office@2gai.com to the attention of John Grguric.

The information contained in the Addenda supersedes and amends the Drawings, Specifications and Schedules, as set forth therein. Tenderers must include and allow for addenda instructions and information accordingly. Tenderers must state on the Tender Form in the space provided, the numbers of all Addenda received and included for, by them in the preparation of the Tender.

10. Examination of Site

1. Tenderers must visit and examine the site and satisfy themselves as to the conditions of the site, the means of access to it and the nature and quantity of work required, and no allowance will be made by reason of any error or neglect on complying with these requirements.

2. A MANDATORY site visit for all General Contractors will be as follows.

   Date: December 15, 2021 at 11:00 am
   Locations: 3 Lyman Street, St. Catharines, ON at rear Cathedral parking lot

3. COVID-19 protocols for masking and social distancing are in effect.

End of Section

SUPPLEMENTARY CONDITIONS

The Standard Construction Document CCDC-2 2008 for Stipulated Price Contract, 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*, with the following amendments, additions and modifications.

AGREEMENT BETWEEN OWNER AND CONTRACTOR

ARTICLE A-3 – CONTRACT DOCUMENTS

3.1 Add the following to the list of *Contract Documents* in paragraph 3.1:

- CCDC 2 – 2008, Supplementary Conditions
- *General Specifications*
- Technical Specifications
- Drawings
- Tender Addenda
- Tender

ARTICLE A-5 – PAYMENT

5.1 Amend the first sentence of paragraph 5.1, so that it reads as follows:

Subject to the provisions of the *Contract Documents*, and in accordance with legislation and statutory regulations respecting holdback percentages and where such legislation or regulations do not exist or apply, subject to a holdback of 10% and subject to a 2% deficiency holdback (if deficiency exists) to the Owner moneys shall be in Canadian funds.

5.1.3 Amended paragraph 5.1.3 so that it reads as follows:

Upon receipt of the Consultant's final certificate for payment, pay to the *Contractor* the unpaid balance of the Contract Price Less the 2% holdback for deficiency issues as per 5.1accumulated from previous progress draws to the contract

5.3.1 Delete paragraph 5.3.1 and 5.3.2 in its entirety.

ARTICLE A-9 – CONFLICT OF INTEREST

Add new Article A-9 – Conflict of Interest:

9.1 The *Contractor*, all of the *Subcontractors,* and any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall not engage in any activity or provide any services where such activity or the provision of such services creates a conflict of interest (actually or potentially, in the sole opinion of the *Owner*) with the provision of the *Work* pursuant to the *Contract*. The

Contractor acknowledges and agrees that a conflict of interest includes the use of *Confidential Information* where the *Owner* has not specifically authorized such use.

9.2 The *Contractor* shall disclose to the *Owner*, in writing, without delay any actual or potential situation that may be reasonably interpreted as either a conflict of interest or a potential conflict of interest, including the retention of any *Subcontractor* or *Supplier* that is directly or indirectly affiliated with or related to the *Contractor*.

9.3 The *Contractor* covenants and agrees that it will not hire or retain the services of any employee or previous employee of the Owner where to do so constitutes a breach by such employee or previous employee of the employee or previous employee's employment contract or the previous employer's conflict of interest policy, as it may be amended from time to time.

9.4 A breach of this Article by the *Contractor*, any of the *Subcontractors,* or any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall entitle the *Owner* to terminate the *Contract*, in addition to any other rights and remedies that the *Owner* has in the *Contract*, in law, or in equity.

ARTICLE A-10 – CONFIDENTIALITY

Add new Article A-10 – Confidentiality:

10.1 The *Contractor* agrees to ensure that it shall, both during or following the term of the *Contract*, maintain the confidentiality and security of all *Confidential Information* and *Personal Information*, and that it shall not directly or indirectly disclose, destroy, exploit, or use any *Confidential Information* or *Personal Information*, except where required by law, without first obtaining the written consent of the *Owner*. The *Contractor* may disclose any portion of the *Contract Documents* or any other information provided to the *Contractor* by the *Owner* to any *Subcontractor* or *Supplier* if the *Contractor* discloses only such information as is necessary to fulfill the purposes of the *Contract* and the *Contractor* has included a commensurate confidentiality provision in its contract with the *Subcontractor* or *Supplier*. The *Contractor* acknowledges that it will comply with all requirements at law with respect to the handling of *Personal Information* and *Confidential Information*. The *Contractor* acknowledges that the *Owner* is bound by the provisions of the *Municipal Freedom of Information and Protection of Privacy Act* ("*MFIPPA*"). The *Contractor* further acknowledges that the *Owner* may be required to disclose any or all of the *Confidential Information* and *Personal Information* in the event that it is compelled to do so by law, through a request under *MFIPPA*, or by the rules of any applicable regulatory authority.

DEFINITIONS

Add the following definitions:

0. As-Built Drawings

As-Built Drawings means drawings prepared by the Contractor by marking on a copy of the Drawings the changes from the Drawings which occur during construction including, but are not limited to the exact location of major building components that were shown generally on the Drawings.

2a. Confidential Information

Confidential Information means all the information or material of the *Owner* that is of a proprietary or confidential nature, whether it is identified as proprietary or confidential or not, including but not limited to information and material of every kind and description (such as drawings and move-lists) which is communicated to or comes into the possession or control of the *Contractor* at any time, but *Confidential Information* shall not include information that:

1) is or becomes generally available to the public without fault or breach on the part of the *Contractor*, including without limitation breach of any duty of confidentiality owed by the *Contractor* to the *Owner* or to any third party, but only after that information becomes generally available to the public;

2) the *Contractor* can demonstrate to have been rightfully obtained by the *Contractor* from a third party who had the right to transfer or disclose it to the *Contractor* free of any obligation of confidence;

3) the *Contractor* can demonstrate to have been rightfully known to or in the possession of the *Contractor* at the time of disclosure, free of any obligation of confidence; or

4) is independently developed by the *Contractor* without use of any *Confidential Information*.

12b. Personal Information

Personal Information has the same definition as in subsection 2(1) of *MFIPPA* and includes an individual's name, address, age, date of birth, sex, and religion, whether recorded in printed form, on film, by electronic means, or otherwise and disclosed to the *Contractor*.

GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

1.1 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.

GC 1.1 CONTRACT DOCUMENTS

.1 Add new sentence to the end of paragraph 1.1.6:

The S*pecifications* 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* or as between them and the *Contractor* with respect to such divisions.

.2 Add new subparagraph 1.1.7.5:

1.1.7.5 noted materials and annotations shall take precedence over graphic indications*.*

.3 Delete paragraph 1.1.8 in its entirety and substitute new paragraph 1.1.8:

1.1.8 The *Owner* shall provide the *Contractor*, without charge, three (3) copies of the *Contract Documents.*

GC 1.3 RIGHTS AND REMEDIES

.1 Delete the word "No" from the beginning of paragraph 1.3.2 and substitute the words:

"Except with respect to the notice requirements set out in paragraphs 6.4.1, 6.5.4, and 6.6.1, no …".

GC 1.4 ASSIGNMENT

.1 Delete paragraph 1.4.1 in its entirety and substitute new paragraph 1.4.1:

1.4.1 The *Owner* may assign the *Contract* or a portion thereof without the consent of the *Contractor*. The *Contractor* may not assign the *Contract* or a portion thereof without the consent of the *Owner*, and the granting of such consent shall be in the *Owner's* absolute discretion.

GC 2.4 DEFECTIVE WORK

.1 Add new subparagraphs 2.4.1.1 and 2.4.1.2:

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 *Owne*r or the *Consultant*.

2.4.1.2 When applicable, the *Contractor* shall give priority to the correction of any defective work or deficiencies which the *Owner* determines adversely affect its day-to-day operations.

GC 3.1 CONTROL OF THE WORK

.1 Add new paragraph 3.1.3:

3.1.3 Prior to commencing the *Work*, the *Contractor* shall verify, at the *Place of the Work*, all relevant measurements and levels necessary for the proper completion 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 in the *Contract Documents*, the *Contractor* shall immediately notify the *Consultant* in writing and obtain *Supplemental Instructions* from the *Consultant* before proceeding with any part of the affected work.

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

.1 Delete subparagraph 3.2.2.1 in its entirety

.2 Delete subparagraph 3.2.2.2 in its entirety

.3 Add new subparagraph 3.2.3.4:

3.2.3.4 Subject to General Condition 9.4 - CONSTRUCTION SAFETY, where paragraph 3.2.4 of General Condition 3.2 - CONSTRUCTION BY OWNER OR OTHER CONTRACTORS applies, for the *Owner's* own forces and for other contractors performing work identified in the *Contract Documents*, 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 as that term is defined in the *Occupational Health and Safety Act*.

GC 3.4 DOCUMENT REVIEW

.1 Delete paragraph 3.4.1 in its entirety and substitute new paragraph 3.4.1:

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 be undertaken with the standard of care described in paragraph 3.14.1 of the *Contract*. 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 through

the exercise of the required standard of care. 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*.

.2 Add new paragraph 3.4.2:

3.4.2 If, at any time, the *Contractor* finds errors, inconsistencies, or omissions in the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, the *Contractor* shall immediately notify the *Consultant*, and request a *Supplemental Instruction, Change Order,* or *Change Directive,* as the case may require. Neither the *Owner* nor the *Consultant* will be responsible for the consequences of any action of the *Contractor* based on oral instructions.

GC 3.5 CONSTRUCTION SCHEDULE

.1 Delete paragraph 3.5.1 in its entirety and substitute new paragraph 3.5.1:

3.5.1 The *Contractor* shall,

.1 within 15 days following the award of the *Contract*, prepare and submit to the *Owner* and the *Consultant* for their review and acceptance, a construction schedule that indicates the timing of the activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time* and in accordance with the *Contract Documents.* Unless otherwise agreed to in writing, in advance by the *Owner* and the *Contractor*, when required by the *Specifications* to employ construction scheduling software, the *Contractor* shall employ the software Microsoft Project or a comparable software as acceptable to the *Consultant* or the *Owner*, in generating the construction schedule, which permits the progress of the *Work* to be monitored in relation to the critical path established in the schedule. The *Contractor* shall provide the construction schedule and any successor or revised schedules to the *Owner* in electronic format and paper copy. When required by the *Specifications* to employ construction scheduling software, the *Contractor* shall provide the construction schedule to the *Owner* in editable format, together with a record version in PDF format. Once accepted by the *Owner* and

the *Consultant*, the construction schedule submitted by the *Contractor* shall become the baseline construction schedule;

.2 provide the expertise and resources, such resources including manpower and equipment, as are necessary to maintain progress under the accepted baseline construction schedule or any successor or revised schedule accepted by the *Owner* pursuant to General Condition 3.5 – CONSTRUCTION SCHEDULE;

.3 monitor the progress of the *Work* on a weekly basis relative to the baseline construction schedule, or any successor or revised schedule accepted by the *Owner* pursuant to General Condition 3.5 – CONSTRUCTION SCHEDULE, update the schedule on a bi-weekly basis and advise the *Consultant* and the *Owner* in writing of any variation from the baseline or slippage in the schedule; and

.4 if, after applying the expertise and resources required under subparagraph 3.5.1.2, the *Contractor* forms the opinion that the variation or slippage in schedule reported pursuant to subparagraph 3.5.1.3 cannot be recovered by the *Contractor*, it shall, in the same notice, indicate to the *Consultant* and the *Owner* if the *Contractor* intends to apply for an extension of *Contract Time* as provided in PART 6 of the General Conditions - CHANGES IN THE WORK.

.2 Add new paragraph 3.5.2:

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, or if the *Contractor* has given notice of such to the *Owner* or the *Consultant* pursuant to subparagraph 3.5.1.3, the *Contractor* shall take appropriate steps to cause the actual progress of the *Work* to conform to the schedule or minimize the resulting delay 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, then the *Contractor* shall proceed in accordance with General Condition 6.5 – DELAYS.

GC 3.6 SUPERVISION

.1 Delete paragraph 3.6.1 in its entirety and substitute new paragraph 3.6.1:

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

.2 Add new paragraph 3.6.3:

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 and security of the site or the *Owner's* operations. Immediately upon receipt of the request, the *Contractor* shall make arrangements to appoint an acceptable replacement.

GC 3.8 LABOUR AND PRODUCTS

.1 Delete paragraph 3.8.2 and replace with new paragraph 3.8.2:

3.8.2 Unless otherwise specified in the Contract Documents, Products provided shall be new and as specified. The *Contractor* shall not provide substitutions for specified Products without the express written consent of the Consultant and the Owner.

GC 3.11 USE OF THE WORK

.1 Add new paragraph 3.11.3:

3.11.3 The *Contractor* shall abide by and enforce directives and policies of the *Owner* and the County of Brant, including any by-laws, regarding signs, advertisements, fires and smoking at the *Place of the Wor*k as directed by the *Owner* or required by law.

Add new General Conditions 3.14 and 3.15:

GC 3.14 PERFORMANCE BY CONTRACTOR

3.14.1 In performing its services and obligations under the *Contract*, the *Contractor* shall exercise the 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 performance of the *Contractor's* obligations, duties, and responsibilities shall be judged against this standard. The *Contractor* shall exercise the same standard of care, skill, 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 any of its appointed representatives, 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*.

GC 3.15 RIGHT OF ENTRY

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

GC 4.1 CASH ALLOWANCES

.1 Delete paragraph 4.1.4 in its entirety and substitute new paragraph 4.1.4:

4.1.4 Where the actual cost of the *Work* under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the *Owner's* direction, to cover the shortfall, and, in that case, there shall be no additional amount

added to the *Contract Price* for overhead and profit. Only where the actual cost of the *Work* under all cash allowances exceeds the total amount of all cash allowances shall the *Contractor* be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the *Contract Documents*.

.2 Delete paragraph 4.1.5 in its entirety and substitute new paragraph 4.1.5:

4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price* by *Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount.

.3 Add new paragraph 4.1.8:

4.1.8 The *Owner* reserves the right to call, or to have the *Contractor* call, for competitive bids for portions of the *Work*, to be paid for from cash allowances.

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

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

.2 Delete paragraph 5.1.1 in its entirety and substitute new paragraph 5.1.1:

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 fulfil their respective obligations under the *Contract*.

.3 Delete paragraph 5.1.2 in its entirety.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

.1 Add to the end of paragraph 5.2.7 the following new sentence:

Any *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall remain at the risk of the *Contractor* notwithstanding that title has passed to the *Owner* pursuant to General Condition 13.1 - OWNERSHIP OF MATERIALS.

.2 Add new paragraphs 5.2.8, 5.2.9, and 5.2.10:

5.2.8 As a condition of receiving each progress payment after the first, the *Contractor* shall submit a Statutory Declaration on an original form CCDC Document 9A-2001, attesting to the truth of the statements made therein.

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

5.2.10 The *Contractor* shall prepare current *As-Built Drawings* during the course of the *Work*, 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* may retain a reasonable amount and up to a maximum of the amounts outlined in paragraph 5.4.6, from any progress payment for the value of the *As-Built Drawings* not presented for review until the *As-Built Drawings* are presented for review.

GC 5.3 PROGRESS PAYMENT

.1 Delete subparagraph 5.3.1.3 in its entirety and substitute new subparagraph 5.3.1.3:

.3 the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT no later than 30 calendar days after the date of a certificate of payment issued by the *Consultant.*

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

.1 Delete paragraph 5.4.3 in its entirety and substitute new paragraph 5.4.3:

5.4.3 Immediately prior to 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 deficiencies.

.2 Add new paragraphs 5.4.4, 5.4.5, 5.4.6, 5.4.7, 5.4.8 and 5.4.9:

5.4.4 Within 7 calendar days of receiving a copy of the certificate of *Substantial Performance of the Work* signed by the *Consultant*, the *Contractor* shall publish a copy of the certificate in a construction trade newspaper (as that term is defined in the *Construction Lien Act*) and shall provide to the *Consultant* and the *Owner* the date of publication and

the name of the construction trade newspaper in which the publication occurred. If the *Contractor* fails to comply with this provision, the *Owner* may publish a copy of the certificate and charge the *Contractor* with the costs so incurred.

5.4.5 Prior to submitting its written application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* all:

.1 guarantees;
.2 warranties;
.3 certificates;
.4 testing and balancing reports;
.5 distribution system diagrams;
.6 spare parts;
.7 maintenance manuals;
.8 samples;
.9 existing reports and correspondence from authorities having jurisdiction in the *Place of the Work*; 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 substantially performed in conformance with the requirements of municipal, governmental, and utility authorities having jurisdiction in the *Place of the Work*.

5.4.6.1 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 with the use and occupancy of the *Project* in a material way, the failure to deliver shall not be grounds for the *Consultant* to refuse to certify *Substantial Performance of the Work*. If the *Contractor* fails to deliver any of the materials required in subparagraphs 5.4.5.7 or 5.4.5.8, the *Consultant* shall retain from the payment of holdback under General Condition 5.5 - PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK, the amount set out in paragraph 5.4.7., until the materials required pursuant to subparagraphs 5.4.5.7 or 5.4.5.8 are delivered.

5.4.6.2 Should the *As-Built Drawings* not be delivered in accordance with subparagraph 5.2.10 or any documents or materials not be delivered in accordance with paragraph 5.4.5 by the earlier of 60 days following publication of the

certificate of Substantial Performance of the Work and the submission of the Contractor's application for final payment under paragraph 5.7.1 of General Condition 5.7 – FINAL PAYMENT, then the amount previously retained pursuant to paragraph 5.2.10 or 5.4.7 shall be forfeit to the *Owner* as compensation for the damages deemed to have been incurred by the *Owner*, and not as a penalty, arising from the failure to deliver the documents or materials, and the *Contract Price* shall be reduced accordingly.

5.4.9 Together with the submission of its written application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* and to the *Owner* a statutory declaration setting forth in reasonable detail any then outstanding and unresolved disputes or claims between the *Contractor* and any *Subcontractor* or *Supplier,* including any claims allegedly arising from delay, which are, directly or indirectly, related to any then outstanding or anticipated disputes or claims between the *Contractor* and the *Owner,* and this disclosure shall, at a minimum:

.1 identify the parties involved;

.2 identify the amount in dispute;

.3 provide a brief statement summarizing the position of each party;

.4 include copies of any correspondence or documents in support of either party's position;

.5 include copies of any documents of any court or arbitration process related to the matter;

.6 identify the dispute or claim between the *Contractor* and the *Owner* to which the matter relates; and

.7 include a copy of any written agreement or a summary of any oral agreement between the parties related to resolution of the matter.

The disclosure requirements detailed herein are of a continuing nature and survive completion of the *Work*. Accordingly, the *Contractor* shall supplement the information provided with the original statutory declaration with additional materials pertaining to new or existing disputes or claims, as they become available. The *Contractor* shall not be entitled to recover from the *Owner*

any amount pertaining to any claim or dispute referred to in this paragraph, if the provisions of this paragraph have not been fully complied with. For greater certainty, the *Contractor* is not obliged to make the aforementioned disclosure with respect to any dispute or claim that is not related to or does not touch upon any then outstanding and unresolved dispute or claim between the *Contractor* and the *Owner*.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

.1 Add new subparagraph 5.5.1.3:

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

.2 Delete from line 1 of paragraph 5.5.2, the words, “the statement” and substitute the words:

“the documents”.

.3 Delete paragraph 5.5.3 in its entirety.

GC 5.7 FINAL PAYMENT

.1 Delete paragraph 5.7.1 in its entirety and substitute new paragraph 5.7.1:

5.7.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment. The *Contractor’s* application for final payment shall be accompanied by any documents or materials not yet delivered pursuant to paragraph 5.4.5. The *Work* shall be deemed not to be performed until all of the aforementioned documents have been delivered.

.2 Delete from the first line of paragraph 5.7.2 the words, “calendar days” and substitute the words:

“*Working Days*”.

.3 Delete from the second line of paragraph 5.7.4 the words, “calendar days” and substitute the words:

“*Working Days*”.

.4 Add new paragraph 5.7.5:

5.7.5 Prior to the release of the finishing holdback provided for under the *Construction Lien Act*, the *Contractor* shall submit:

.1 *Contractor's* written request for release of the finishing holdback, including a statement that no written notices of lien have been received by it;
.2 a Statutory Declaration CCDC 9A-2001;
.3 a final Workplace Safety & Insurance Board Clearance Certificate.

GC 6.2 CHANGE ORDER

.1 Add new paragraph 6.2.3:

The *Contractor* may apply mark-ups for overhead and profit to approved changes to the *Contract Price* as follows:

.1 compensation for overhead and profit shall be determined by multiplying the approved change in *Contract Price* by 0.10.

GC 6.3 CHANGE DIRECTIVE

.1 Delete paragraph 6.3.3 in its entirety.

.2 Delete subparagraph 6.3.7.1(1) and replace it with:

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

.3 Delete subparagraph 6.3.7.1(2) and replace it with

"(2) intentionally left blank."

.4 Amend subparagraph 6.3.7.1(3) so that, as amended, it reads:

"(3) engaged in the preparation of *Shop Drawings,* fabrication drawings, coordination drawings and *As-Built Drawings*: or…"

.5 Amend subparagraph 6.3.7.1(4) so that, as amended, it reads:

"(4) including clerical staff engaged in processing changes in the *Work*."

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

.1 Add new paragraph 6.4.5:

6.4.5 If the *Contractor* was given access to the *Place of the Work* prior to the submission of the bid on which the

Contract was awarded, then the *Contractor* confirms that it carefully investigated the *Place of the Work* and, in doing so, applied to that investigation the degree of care and skill required by paragraph 3.14.1. In those circumstances, notwithstanding the provisions of paragraph 6.4.1, the *Contractor* is not entitled to an adjustment to the *Contract Price* or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by the *Contractor* by such careful investigation, or which could have been reasonably inferred from the material provided with the *Contract Documents*. In those circumstances, should a claim arise, the *Contractor* will have the burden of establishing that it could not have discovered the materially different conditions from a careful investigation, because of restrictions placed on its access or inferred the existence of the conditions from the material provided with the *Contract Documents*.

GC 6.5 DELAYS

.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."

.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."

.3 Delete subparagraph 6.5.3.3 and place the word "or" at the end of 6.5.3.2.

.4 Add new paragraph 6.5.6.

6.5.6 If the *Contractor* is delayed in the performance of the *Work* by abnormally adverse weather conditions beyond a period of 3 calendar days or, in any event, which has the effect or the possible effect of delaying the *Contract Time*, the *Contractor* shall immediately notify the *Consultant* in an attempt to mitigate any delays to the *Contract Time* as a result of the abnormally adverse weather conditions.

.5 Add new paragraph 6.5.7.

6.5.7 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone directly or indirectly employed or engaged by the *Contractor,* or by any cause within the *Contractor's* control, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may decide in consultation with the

Contractor. The *Owner* shall be reimbursed by the *Contractor* for all reasonable costs incurred by the *Owner* as the result of such delay, including, but not limited to, the cost of all additional services required by the *Owner* from the *Consultant* or any subconsultants, project managers, or others employed or engaged by the *Owner*. The *Contractor* acknowledges that the *Contract Time* is a material component to the Contract and has relied upon the *Contract Time* as an enticement into this Contract. Reasonable costs and damages incurred by the *Owner* as a result of the delays identified in this Contract may also include, without limitation, student and staff relocation costs and expenses, communication resources associated labour costs in dealing with *Owner's* staff relocation issues resulting from the delay and any and all other associated, consequential and reputational damages resulting therefrom.

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

.1 Revise the heading, **"OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT"** to read, **"OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT"**

.2 Delete paragraph 7.1.6 and add new paragraphs 7.1.6, 7.1.7, 7.1.8, 7.1.9, 7.1.10, and 7.1.11:

7.1.6 In addition to its right to terminate the Contract set out herein, the *Owner* may terminate this *Contract* at any time for any other reason and without cause upon giving the *Contractor Notice in Writing* to that effect. In such event, the *Contractor* shall be entitled to be paid for all *Work* performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*, but in no event shall the *Contractor* be entitled to be compensated for any loss of profit on unperformed portions of the *Work*, or indirect, special, or consequential damages incurred.

7.1.7 The *Owner* may suspend *Work* under this *Contract* at any time for any reason and without cause upon giving the

Contractor Notice in Writing to that effect. In such event, the *Contractor* shall be entitled to be paid for all *Work* performed to the date of suspension and be compensated for all actual costs incurred arising from the suspension, including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the suspension of the *Work*, but in no event shall the *Contractor* be entitled to be compensated for any indirect, special, or consequential damages incurred. In the event that the suspension continues for more than 180 calendar days, the *Contract* shall be deemed to be terminated and the provisions of paragraph 7.1.6 shall apply.

7.1.8 In the case of either a termination of the *Contract* or a suspension of the *Work* under General Condition 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT or General Condition 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall use its best commercial efforts to mitigate the financial consequences to the *Owner* arising out of the termination or suspension, as the case may be.

7.1.9 Upon the resumption of the *Work* following a suspension under General Condition 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT or General Condition 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* will endeavour to minimize the delay and financial consequences arising out of the suspension.

7.1.10 The *Contractor's* obligation under the *Contract* as to quality, correction, and warranty of the *Work* performed by the *Contractor* up to the time of termination or suspension shall continue after such termination of the *Contract* or suspension of the *Work*.

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

.1 Delete paragraph 7.2.2 in its entirety.

.2 Delete subparagraph 7.2.3.1 in its entirety.

.3 Delete subparagraph 7.2.3.3 in its entirety and substitute new subparagraph 7.2.3.3:

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

.4 Delete from subparagraph 7.2.3.4, the words:

", except for General Condition 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER,"

.5 Delete from the end of paragraph 7.2.4 the words "or terminate the *Contract*" and substitute the words:

"until the default is corrected*,* provided, however, that in the event of such suspension, the provisions of subparagraph 7.1.10 shall apply. If the *Contractor's Notice in Writing* to the *Owner* was given pursuant to subparagraph 7.2.3.3, then, 180 days after the delivery of the *Notice in Writing*, the *Contractor* may terminate the *Contract,* provided, however, that in the event of such termination, the provisions of subparagraph 7.1.10 shall apply."

GC 8.1 AUTHORITY OF THE CONSULTANT

.1 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*.

GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

.1 Delete paragraphs 8.2.6, 8.2.7, and 8.2.8 in their entirety and substitute new subparagraph 8.2.6:

8.2.6 When a dispute has not been resolved through negotiation or mediation, within 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.2.5, either party may give a *Notice in Writing* to the other party and to the *Consultant* inviting the other party to agree to submit the dispute to be finally resolved by arbitration, pursuant to provisions of the *Arbitration Act, 1991*. If the other party wishes to accept the invitation to

submit the dispute to arbitration, it shall so indicate by the delivery of a responding *Notice in Writing* within 10 *Working Days* of receipt of the invitation. If, within the required times, no invitation is made or, if made, is not accepted, either party may refer the dispute to the courts or to any other form of dispute resolution, including arbitration, which the parties may agree to use.

GC 9.1 PROTECTION OF WORK AND PROPERTY

.1 Delete subparagraph 9.1.1.1 in its entirety and substitute new subparagraph 9.1.1.1:

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;

.2 Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2:

9.1.2 Before commencing any *Work*, the *Contractor* shall determine the locations of all underground utilities and structures indicated in or inferable from the *Contract Documents*, or that are inferable from an inspection of the *Place of the Work* exercising the degree of care and skill described in paragraph 3.14.1.

.3 Add new paragraph 9.1.5:

9.1.5.1 With respect to any damage to which paragraph 9.1.4 applies, the *Contractor* shall neither undertake to repair or replace any damage whatsoever to the work of other contractors, or to adjoining property of the *Owner* or any third party, nor acknowledge that 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*. Where, however, there is danger to life, the environment, or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger.

.4 Add new paragraph 9.1.6:

9.1.5.2 The *Contractor* shall be responsible for securing the *Place of Work* at all times and shall take all reasonable precautions necessary to protect the *Place of Work*, its contents, materials (including *Owner*-supplied materials) and the public from loss or damage during and after

working hours. Where the Consultant or the *Owner* deems the provision of security guard services to be necessary, the *Contractor* shall provide those services at the *Contractor's* expense.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

.1 Add new subparagraph 9.2.5.5

9.2.5.5 take all reasonable steps to mitigate the impact on Contract Time and Contract Price

.2 Delete subparagraph 9.2.7.4 in its entirety.

.3 Add to subparagraph 9.2.8.3 immediately before the comma, the following new words:

"and as a result of the delay"

GC 9.4 CONSTRUCTION SAFETY

.1 Delete paragraph 9.4.1 in its entirety and substitute new paragraph 9.4.1

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

.2 Add new paragraphs 9.4.2, 9.4.3 and 9.4.4:

9.4.2 Prior to the commencement of the *Work*, the *Contractor* shall submit to the *Owner*:

.1 a current Workplace Safety & Insurance Board 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 setting out the *Contractor's* in-house safety programs;

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

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

9.4.4 The *Owner* undertakes to include in its contracts with other contractors and in its instructions to its own forces the requirement that the other contractor or its own forces, as the case may be, comply with the policies and procedures of and the directions and instructions from the *Contractor* with respect to occupational health and safety and related matters. Prior to admission to the *Place of the Work*, the *Contractor* may, as a condition of admission, require any other contractor or the *Owner's* own forces to sign a written acknowledgement in the following form:

Acknowledgement

The undersigned acknowledges that the *Work* it will perform on behalf of the *Owner* requires it to enter a *Place of the Work* which is under the total control of a *Contractor* that has a *Contract* with the *Owner*, pursuant to which the *Contractor* has assumed overall responsibility for compliance with all aspects of the applicable health and safety legislation, including all the responsibilities of the "constructor" under the *Occupational Health and Safety Act*, as well as responsibility to co-ordinate and schedule the activities of our *Work* with the *Work* of the *Contractor* under its *Contract*. The undersigned agrees to comply with the *Contractor*'s directions and instructions with respect to health, safety, co-ordination, and scheduling and acknowledges that its failure to do so will be cause for termination of employment or of the undersigned's *Contract* with the *Owner,* as the case may be. The undersigned also agrees to have the *Contractor* named as

an additional insured on any comprehensive liability insurance policy, where such insurance is required.

_____
Name:
Title:
Date:

GC 9.5 MOULD

.1 Add to subparagraph 9.5.2.3 immediately before the comma, the following new words:

"and as a result of the delay"

.2 Delete subparagraph 9.5.3.4 in its entirety.

GC 10.1 TAXES AND DUTIES

.1 Add new paragraph 10.1.3:

10.1.3 Where the *Owner* is entitled to an exemption, reduction 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*, 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.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

.1 Add to the end of paragraph 10.2.4 the following words:

"The *Contractor* shall notify the Chief Building Official or the registered code agency, where applicable, of the readiness, substantial completion, and completion of the stages of construction set out in the *Ontario Building Code*. The *Contractor* shall be present at each site inspection by an inspector or registered code agency. If any laws, ordinances, rules, regulations, or codes conflict, the more stringent shall govern."

.2 Delete from the first line of paragraph 10.2.5 the word, “The” and substitute the words:

“Subject to paragraph 3.4.1, the”.

GC 10.3 PATENT FEES

.1 Delete paragraph 10.3.2 in its entirety.

GC 10.4 WORKERS’ COMPENSATION

.1 Add to subparagraph 10.4.1 immediately after the first comma, the following new words:

"again with each application for progress payment, and"

.2 Add to the beginning of subparagraph 10.4.2 the following new words:

"The *Contractor* shall ensure that each *Subcontractor* complies with the workers' compensation legislation at the *Place of the Work.*

.3 Add new paragraph 10.4.3:

10.4.3 Where a *Subcontractor* is not required to participate in the insurance plan provided for under the workers’ compensation legislation, the *Contractor* shall require the *Subcontractor* to provide a sworn declaration of its exemption as a condition of the *Subcontractor’s* admission to the *Place of Work*. When requested by the *Owner,* the *Contractor* shall require the *Subcontractor* to provide a letter of exemption under the workers’ compensation legislation.

GC 11.1 INSURANCE

.1 Add new paragraphs 11.1.1(a), (b), (c), (d) and (e)

11.1.1(a) Catholic Cemeteries of the Diocese of Hamilton (CCDH) will require the successful candidate to obtain and submit Comprehensive General Liability Insurance in the amount of no less than $5,000,000 for each occurrence or accident and covering all sums which the Proponent may become legally obligate to pay for damages a result of bodily injury (including death at any time resulting there from) sustained by any person or persons or because of damage to, destruction of, or loss of use of property caused by an

occurrence or accident arising out of any operations carried out in connection with this RFP or RFP Process.

11.1.1(b) Vehicle Public Liability and Property Damage insurance, in the amount of $2,000,000 per occurrence, for vehicle used by Proponents or Proponent Team Members (or their respective directors, officers, employees, consultants, Advisors and agents) while on or at the Site or on or at any facilities or premises owned by CCDH and proof of a current Errors and Omissions Insurance policy.

11.1.1(c) To satisfy this requirement the Consultant must provide proof of coverage, by way of a Certificate of Insurance, naming the Roman Catholic Episcopal Corporation of the Diocese of Hamilton in Ontario operating as The Catholic Cemeteries of the Diocese of Hamilton as the insured, prior to commencement of the project.

11.1.1(d) As a condition of allowing access to the Site, Existing Facilities or any facilities or premises of CCDH, CCDH reserves the right to require Proponents to provide evidence acceptable to CCDH that the insurance required is in place.

11.1.1(e) If a Proponent proposes to perform any site investigations at the Site or Existing Facilities, the risk related to which may not be fully insure under the above policies, CCDH may, in its sole discretion, require the Proponent at its own cost, to obtain insurance additional to that already specified.

.2 Delete paragraph 11.1.2 in its entirety and substitute new paragraph 11.1.2:

11.1.2 In all instances in paragraph 11.1.1 where the *Contractor* is required to obtain insurance coverages naming or jointly naming the *Owner.* Each of the policies of insurance shall also contain a provision requiring not less than 60 days written notice to each named insured prior to cancellation or any change that would reduce coverage. At least 10 calendar days prior to commencement of the *Work* and upon any renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements applicable to the *Work*.

.3 Add new subparagraph 11.1.9:

11.1.9 The parenthetical reference in CCDC 41 - INSURANCE REQUIREMENTS, paragraph 4 which reads: "(excluding flood and earthquake)" is deleted and replaced with the following: "(including flood, earthquake, testing, and commissioning)".

GC 11.2 CONTRACT SECURITY

.1 Delete paragraph 11.2.1 in its entirety.

.2 Delete paragraph 11.2.2 in its entirety.

GC 12.1 INDEMNIFICATION

.1 Delete General Condition 12.1 – INDEMNIFICATION in its entirety and substitute:

12.1 The *Contractor* shall indemnify and hold harmless the *Owner*, the *Consultant*, and their respective agents, appointees, directors, trustees, officers, Project Managers, and employees from and against all claims, demands, losses, expenses, costs, damages, actions, suits or proceedings that arise out of or are attributable to the *Contractor's* performance of the *Contract*. Nothing in this paragraph 12.1, shall limit any claim that the *Owner* may have under the insurance coverage to be provided under General Condition 11.1 - INSURANCE.

.2 Add new paragraph 12.2:

12.2 The indemnity given in paragraph 12.1 shall be honoured by the Contractor and may be asserted and claimed by the parties seeking the benefit of same for a period of six years following the date of Substantial Performance of the Work, as permitted under the Limitations Act, 2004.

GC 12.2 WAIVER OF CLAIMS

.1 Delete the reference to "395 calendar days" in the last line of paragraph 12.2.2 and substitute "120 calendar days".

.2 Delete the last sentence of subparagraph 12.2.3.4 and substitute:

"Substantial defects or deficiencies" mean 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 Taxes*;

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

but, in any event, a defect or deficiency in the *Work* which affects 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* shall be deemed to be a "substantial defects or deficiencies" regardless of the cost of repair.

.3 Amend paragraph 12.2.5 by adding ",12.2.3.4" immediately after the reference to paragraph 12.2.3.3.

GC 12.3 WARRANTY

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

"Subject to paragraph 3.4.1, the…".

Add new PART 13 as follows:

PART 13 OTHER PROVISIONS

GC 13.1 OWNERSHIP OF MATERIALS

13.1.1 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 when notified in writing to do so by the *Consultant*. Notwithstanding that ownership of the *Work* and *Products* may vest in the *Owner*, the risk of all *Work* and *Products* shall remain with the *Contractor* until the *Work* and *Products* are accepted and assumed by the *Owner* as otherwise set out in the *Contract*.

GC 13.2 CONSTRUCTION LIENS

13.2.1 In the event that a claim for lien is registered against the *Project* by a *Subcontractor* or *Supplier*, and provided the *Owner* has paid all amounts properly owing under the *Contract*, then the *Contractor* shall, at its own expense within 10 calendar days, ensure that any and all claims for lien and certificates of action are

discharged, released, or vacated by the posting of security or otherwise.

13.2.2 In the event that the *Contractor* fails to comply with the requirements of paragraph 13.2.1, the *Owner* may fulfil those requirements without *Notice in Writing* to the *Contractor* and set off and deduct from any amount owing to the *Contractor*, all costs and associated expenses, including the costs of posting security and all legal fees and disbursements associated with discharging or vacating the claim for lien or certificate of action and defending the action on a substantial indemnity basis. If there is no amount owing by the *Owner* to the *Contractor*, then the *Contractor* shall reimburse the *Owner* for all of the said costs and associated expenses.

GC 13.3 CONTRACTOR DISCHARGE OF LIABILITIES

13.3.1 In addition to the obligations assumed by the *Contractor* pursuant to General Condition 3.7 – SUBCONTRACTORS AND SUPPLIERS, 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 13.4 RECORDS/DAILY REPORTS/DAILY LOGS

13.4.1 The *Contractor* shall maintain and keep accurate *Project* records (which means all tangible records, documents, computer printouts, electronic information, books, plans, *Drawings*, *Specifications*, accounts or other information relating to the *Work*) in its office in accordance with requirements of law, but in any event for not less than 6 years from *Substantial Performance of the Work* or until all claims have been settled. During this time, the *Contractor* shall allow the *Owner* and the *Consultant* access to the *Project* records during normal business hours upon the giving of reasonable notice. The *Contractor* shall ensure that equivalent provisions to those provided herein are made in each subcontract and shall require the *Subcontractor*s and *Suppliers* to incorporate them into every level of contract thereunder for any part of the *Work*.

END OF DOCUMENT

1. Definitions

1. The following Section of this Specification are of the abbreviated type and include incomplete sentences. Definite and indefinite articles have often been omitted and sentences are written in the form of direct instructions to the Contractor without using the phrase `the Contractor shall.' Standard specifications and other quality references inserted govern materials and workmanship without using phrases `conform with,' `conformity therewith,' etc. Omitted words and phrases to be supplied in the same manner as they are when a note appears on the Drawings.

2. The Specifications are separated into Sections for reference convenience only. Such separation must in no instance make Owner or his Consultants arbiter to establish subcontract limits between Contractor and Subcontractor.

3. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on Drawings and/or in Specifications, including all labour, materials, equipment, tools, services, and incidentals necessary and required to complete the work. Responsibility for breakdown into and extension of subcontracts, including co-ordination of same, rests entirely with the Contractor.

4. Standard Specifications referred to are editions in force at Tender Closing Date.

2. Terminology

1. Consultants are the team of Architects, Engineers and other experts commissioned by the Owner, directly or indirectly, to execute design, contract documents and supervision for the project, including any of their agents or employees.

2. Prime Consultant is the Architect.

3. Contractor is the Firm or Corporation who, having signed the Agreement, has the sole legal responsibility to carry out the work shown or described in the Contract Documents for the Owner, whether contractually assigned to a Subcontractor or supplier, or not.

3. Minimum Standards

1. Unless otherwise specified, work and material to conform or exceed the minimum standards set out in the editions of the Canadian Government Specification Board, Canadian Standards Associations, the Ontario Building Code, Underwriters' Laboratories of Canada, the Canadian Electrical Code, the Local Building Code in force, whichever is applicable.

2. Copies of Standard Specifications referred to in this Specification to be kept on the site.

3. The use of the name (or its abbreviation) of any of the following bodies, accompanied by the reference number of a specification of that body to mean that the entire specification of the body to apply as noted:

    AISC: American Institute of Steel Construction;

ASTM: American Society for Testing Materials;
CEC: Canadian Electric Code;
CGSB: Canadian Government Specification Board;
CISC: Canadian Institute of Steel Construction;
CRCA: Canadian Roofing Contractors' Association;
CSA: Canadian Standards Association;
OBC: Ontario Building Code;
ULC: Underwriters' Laboratories of Canada;
CLA: Canadian Lumbermen's Association.

4. Cooperation

1. Each trade to co-operate with the trades of adjacent or affected work. Supply in good time requirements effecting adjacent and underlying work in writing and items to be set or built in. Similarly, heed requirements and build-in items provided by other trades.

2. Take necessary precautions to protect work of other trades from contamination, marring or other damage due to application or installation processes, methods and activities.

3. General Contractor and each trade to co-operate with Contractors which may be assigned or selected by the Owner to perform work under Cash Allowances. Owner reserves the right to assign non-unionized labour to perform work under Cash Allowances, at Owners discretion.

5. Coordination

1. Co-ordinate the work of all trades in such a manner that each trade co-operates with the trade of adjacent work.

2. Organize weekly jobsite meetings and send out notices stating time and place to Consultants, subcontractors, Suppliers and all others whose presence is required at the meetings.

3. Take note of all persons attending these meetings and submit to Consultants and Owner, Minutes of these Meetings showing any major decisions made and instructions or information required. Prime Consultant to receive duplicate copies.

4. Co-ordinate the Work in this Contract with the work of others awarded work under Cash Allowances.

6. Building Dimensions and Co-ordination

1. Ensure that all necessary job dimensions are taken and all trades are coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for co-ordination.

2. Verify that all 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 resumes.

3. Check and verify all dimensions referring to the work and the interfacing of all services. Verify all dimensions, with the trade concerned when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades co-operate for the proper performance of the Work.

4. Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.

5. All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.

6. Advise Consultant of discrepancies and if there are omissions on drawings, particularly reflected ceiling plans and jointing patterns for paving, ceramic tile, or carpet tile layouts, which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.

7. Ensure that each Subcontractor communicates requirements for site conditions and surfaces necessary for the execution of the Subcontractor's work, and that he provides setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, insets, anchors, accessories, fastenings, connections and access panels. Inform other Subcontractors whose work is affected by these requirements and preparatory work.

8. Prepare interference drawings to properly co-ordinate the work where necessitate. Refer to Section 01340.

7. Use of Premises Before Substantial Performance

1. The Owner shall have the right to enter and occupy the building, in whole or in part, for the purpose of placing fittings and equipment, or for other use, before completion of the Contract if, in the opinion of the Consultant, such entry and occupancy does not prevent or interfere with the Contractor in the performance of the Contract. Such entry shall in no way be considered as an acceptance of the Work in whole, or in part, nor shall it imply acknowledgment that terms of the Agreement are fulfilled.

8. Layout of Work

1. Layout work with respect to the work of all trades. Arrange mechanical and electrical work such as piping, ducts, conduits, panels, equipment and the like to suit the architectural and structural details.

2. Alterations necessary due to conflict and interference between trades, to be executed at no cost to the Owner unless notification is given in writing before Tender Closing Date.

9. By-Laws and Regulations

1. Nothing contained in the Drawings and Specifications are to be so construed as to be knowingly in conflict with any law, by-law or regulation of municipal, provincial or other authorities having jurisdiction.

2. Perform work in conformity with such laws, by-laws and regulations and make any necessary changes or deviations from the Drawings and Specifications subsequently required as directed and at no cost to the Owner unless notification is given in writing before Tender Closing Date.

3. Furnish inspection certificates and/or permits as may be applicable as evidence, that installed work conforms with laws, by-laws, and regulations of authorities having jurisdiction.

10. Protection

1. Take necessary precautions and provide and install required coverings to protect material, work and finishes from contamination, damage, the elements, water and frost.

2. Make good any damage or replace damaged materials, as directed. Repairs to be made by the trade having originally installed or fabricated the damaged material, finish or item. Protect electrical equipment from water and the elements.

3. Protect adjacent private and public property from damage and contamination.

4. Protect curbs and sidewalks from damage from trucking by means of boards and the like. Repair, or pay or repair of damage to existing roads and sidewalks.

5. Mark glass after glazing in an acceptable manner, and leave in place until final clean-up.

6. Protect floor finishes from construction traffic and transport of construction materials and equipment by means of 6 mm plywood panels.

11. Delivery, Handling and Storage of Materials

1. Schedule material delivery so as to keep storage at site to the absolute minimum, but without causing delays due to late delivery.

2. Store materials which will be damaged by weather in suitable dry accommodation. Provide heat, as required, to maintain temperatures recommended by material manufacturer.

3. Store highly combustible or volatile materials separately from other materials, and under no circumstances, within the building. Protect against open flame and other fire hazards. Limit volume of supply on the site to minimum required for one day's operations.

4. Handle and store material so as to prevent damage to material, structure and finishes. Avoid undue loading stresses in materials or overloading of floors.

5. Do not store material and equipment detrimental to finished surfaces within areas of the building where finishing has commenced or has been completed. All material storage within the building is subject to relocation, as directed.

6. Deliver package material in original, and Storage of unopened and undamaged containers with manufacturer's labels and seals intact.

12. Debris

1. Assign clean-up duties to a crew with own Foremen which will be of sufficient size to prevent accumulation of debris and dirt in any part of the structure or on the site.

2. Under no circumstances, should debris, rubbish or trash be burned or buried on the site.

13. Cutting, Fitting and Patching

1. Required cutting to be done by General Contractor. Patching and painting of work to be executed by the General Contractor.

2. All subtrades are to notify the General Contractors bidding as to the extent of the cutting, patching, and painting of their respective trades.

3. Drilling, cutting, fitting and patching necessary due to failure to deliver items to be built-in time, or installation in wrong location to be executed, as directed, at no cost to the Owner.

4. Give written notification prior to commencement of drilling and cutting of load bearing structural members and finished surfaces.

5. Cut holes with smooth, true, clean edges, after they are approved by applicable trade. Size holes and openings for hot water and steam pipes, so as to allow for expansion and contraction of such pipes.

14. Fastenings

1. Supply all fastenings, anchors and accessories required for fabrication and erection or work.

2. Metal fastenings to be of the same material as the metal component they are anchoring, or of a metal which will not set up an electrolysis action which would cause damage to the fastening or metal component under moist conditions.

3. Exposed metal fastenings and accessories to be of the same texture, color, and finish as base metal on which they occur. Keep to a minimum; evenly space and lay out.

4. Fastenings to be permanent, of such a type and size and installed in such a manner to provide positive anchorage of the unit to be secured. Wood plugs are not acceptable. Install anchors at required spacing to provide required load bearing or shear capacity.

5. Power actuated fastenings not to be used without prior written approval for specific use.

15. Snow and Ice Removal

1. Remove all snow and ice which may impair the progress of the work, be detrimental to workmen, or impair movement of material on the site.

16. Surplus Materials

1. Surplus materials specifically so specified, to remain property of the Owner and be neatly stockpiled or stored, as directed.

2. All other surplus materials to become property of the Contractor; to be removed from the site and legally disposed of.

17. Existing Trees

1. Preserve carefully all existing trees on the site, except those located in the area to be occupied by the building proper or those so designated for removal.

2. Erect and maintain barricade and protective strapping; prevent seepage and spilling of materials injurious to the root system and take all other precautions to preserve trees.

18. Setting of Work

1. Provide and pay for the services of a Land Surveyor, registered in the Province of Ontario to establish the building location and two (2) widely separated bench marks at the commencement of the work.

2. Lay out building lines for the work and provide substantial stakes, batterboards or monuments to preserve lines and levels.

3. Provide to the Consultant a Survey Plan on Cad indicating location of building on site.

4. Provide to the Consultant a survey certificate, verifying location of all foundation walls relative to property lines, before construction proceeds on the foundation walls.

5. Verify on the site all grades, lines, levels, dimensions and location of hydrants, existing structures, manholes, overhead and buried utilities, existing tress, roadways, sidewalks and the like, shown on the drawings, and report omissions, errors, or inconsistencies, before commencing work.

6. Upon completion of layout work and before commencement of any excavation, give ample notification to allow for inspection of lines and levels. Such inspection does not in any way mitigate the Contractor's responsibility for accuracy of layout.

7. Preserve and protect benchmarks, elevation datum and monuments and check periodically for accuracy until all work is complete. Remove same and their protection, as directed, and make good site.

8. At Substantial Performance, provide a complete as-built survey showing:

- locations of all building perimeter walls, including relocatables and portables.
- all driveways, curbs, parking lots, sidewalks, fences and landscaped area.
- spot levels at locations similar to architectural site plan.
- location of manholes, catch basins, fire hydrants, poles, etc., noting elevations.
- tree locations.

9. At Substantial Performance certify that the building constructed and lot grading is in conformity with the registered site plan agreement and the grading plan, and sign off the site plan in accordance with the requirements of the Municipality and these Specifications.

19. Documents Required and General Duties

1. **At Commencement of Contract**
   - .1 Bonding not required.
   - .2 Supply Public Liability and Property Damage Insurance Certificates.
   - .3 Supply Certificates of good standing from Workers' Compensation Board for the General Contractor and all Subcontractors.
   - .4 Supply Contract Sum Breakdown of all subtrades or parts of work and general expense items.
   - .5 Supply Construction Schedule.
   - .6 Supply Schedule of Shop Drawing Submissions.
   - .7 The Owner has paid for the cost of the Building Permit. Mechanical Subcontractor will pay the cost of other Fees related to the Work Specified under Division 15. Electrical Subcontractor will pay the cost of all permits and fees related to the Work Specified under Division 16.
   - .8 The General Contractor is to pay all other fees and refundable deposits if applicable.

2. **During Construction**
   - .1 Adjust Allowances, as required.
   - .2 Organize Job Meetings in accordance with Section 01200.
   - .3 Supply Monthly Progress Reports and Construction Schedule in accordance with Section 01200.
   - .4 Confirm that payments are being made to subcontractors and suppliers by submission of receipts with the second and subsequent Progress Payment Application. No payment will be made for unincorporated material on the site, unless Bill of Sale in proper format is provided.
   - .5 Submit with each application for payment an "S" curve billing schedule chart indicating activities, billing items, % of work and forecast %, to monitor progress as related to billing. A sample chart will be provided to Contractor.

3. **Upon Completion**
   - .1 Upon completion of work before the Final Certificate of Payment is issued, the following to be observed, executed and submitted:
     - .1 All deficiencies to have been completed in a satisfactory manner.
     - .2 All final clean-up to have been executed, as specified in Section 01710.
     - .3 Finishing Hardware, Inspection and Verification.
     - .4 Organize a Final Inspection tour at which to be present:
       - the Owner's authorized representative;

- the Architectural, Structural, Mechanical and Electrical Consultants, and their supervisory personnel, if any;
- the Contractor and his superintendent.

.5 Where the above procedure is impossible or where any deficiencies remain outstanding, the Owner's representative and the Consultant concerned, to inspect and accept the affected work and/or material upon notification by the Contractor, that all deficiencies involving this Consultant have been made good.

.6 A complete release of all liens arising out of this Contract, other than his own. If a subcontractor or supplier refuses to furnish a release of such a lien, furnish a bond satisfactory to the Owner to indemnify him against any claim under such a lien.

.7 Certificates of good standing from the Workers' Compensation board, for the General Contractor and all Subcontractors.

.8 All reference records, as specified, under Section 01720.

.9 Certificate of Inspection from Mechanical and Electrical Engineers.

.10 Copies of all Lists of Deficiencies with each Deficiency verified when complete by only this project's job Superintendent. The Final List of Deficiencies to be signed, completed by all concerned, if accepted.

.11 Statement of Completion from General Contractor.

.12 Final adjustment of all Allowances.

.13 H.E.P.C. Inspection Certificate and all other Inspection Certificates required by Provincial, Municipal and other authorities having jurisdiction.

.14 Balancing Reports.

.15 As-Built Drawings.

.16 Maintenance manuals.

20. Progress Reports

1. Submit to the Architect, Monthly Progress Reports consisting of a concise narrative and a marked-up summary schedule showing physical percentage complete by item and in total. These progress calculations must agree with the Progress Payment Claims. waterproofing; finishing trades and the like.

2. Keep permanent written daily records on the site on the progress of work. Record to be open to inspection at reasonable times and copies to be furnished upon request. Records to show notes of commencement and completion of different trades and parts of work; daily high and low temperatures and other weather particulars; number of men engaged on the site (including subtrades) broken down in groups for each type of construction work, and particulars about excavation and shoring; erection and removal of form work; pouring and curing of concrete; floor finishing; placing and compaction of backfill, masonry work; roofing;

3. Daily progress to give particulars on commencement and completion of each trade or part of work; form work erections and removal; concrete pouring and curing; floor finishing; masonry work; roofing; waterproofing; finishing trades, tests and inspection and the like.

21. Inspection and Testing

1. The Owner will retain the services of Inspection and Testing Companies. The cost of inspection and testing will be deducted from the Inspection and Testing Allowance specified under Section 01020, “Allowances”.

2. Where tests or inspections reveal work not in accordance with Contract requirements, the Contractor shall pay costs for additional tests or inspections as the Architect may require to verify acceptability of corrected work.

3. The Inspection and Testing by the Owner's Testing Company does not relieve the Contractor of his responsibility to provide his own quality control in order to meet or exceed the requirements of specified standards, codes, design criteria and referenced documents.

End of Section

1. Selection of Products

1. If requested by the Consultant, provide the following services and/or information:
   .1 Assist the Consultant in determining qualified suppliers.
   .2 Obtain proposals from suppliers.
   .3 Make appropriate recommendations for consideration of Consultant.
   .4 Notify Consultant of any effect anticipated by selection of product or supplier under consideration, on construction schedule and contract sum.

2. On notification of selection, enter into purchase agreement with designated supplier.

2. Cash Allowance

1. Expend cash allowance only on the Consultant's written instructions.

2. Include in Contract price the Contractor's charges for handling at site, including uncrating and storage, protection from elements and damage, labour, installation and finishing, testing, adjusting and balancing, and other expenses including overhead and profit on account of Cash Allowance in accordance with Article GC4.1 of the General Conditions of the Contract as amended.

3. Credit the Owner with any unused portion of Cash Allowances in the statement for final payment.

4. If a test made under payment by a specific allowance proves that the material or system is not in accordance with the Documents, then the subsequent testing including Owner's testing of replacement materials or systems shall be Contractor's expense and not taken from Cash Allowance.

5. Add or deduct any variation in cost from the Cash Allowance. No adjustment will be made to Contractor's expense.

6. The amount of each allowance includes the net cost of the product or service, delivery and unloading at the site.

7. All refunds, trade and/or quantity discounts which the Contractor may receive in the purchase of goods under allowances, to be extended to the Owner.

8. Receipted invoices covering all disbursements made by the Contractor under Allowances, to be submitted to the Consultant for audit.

9. Where the Cash Allowance stipulates "Supply Only," the Contract Price and not the Cash Allowances include the installation and hook-up costs. The installation and hook-up of some equipment and materials are specified under other Sections of the Specifications. The General Contract includes the installation and hook-up not specified elsewhere.

10. Contractor's profit and overhead on all Cash Allowances to be carried in his lump sum amount, not in the Cash Allowances.

11. All Cash Allowances will be dealt with in accordance with Article GC4.1 of the General Conditions.

12. All expenditures under Cash Allowances, must be approved by the Owner through the issuance of a cash allowance expenditure certificate prepared by the Architect.

13. Include in the Stipulated Price quoted, a Cash Allowance in the amount of **$25,000**.
    To be allocated as follows:

    1. Include the stipulated sum of $10,000 for the supply only of Hardware required.
    2. Include the stipulated sum of $5,000 for controls.
    3. Include the stipulated sum of $10,000 for Inspections and Testing.

14. H.S.T. Goods and Services tax is not included in Cash Allowance amount and is to be carried in the General Contractor's Stipulated Sum Amount.

15. Refer to Section 01005 for co-operation with others assigned to this Section.

3. Contingency Allowance

1. Included in the Stipulated Price quoted, a Contingency Allowance in the amount of **$80,000.**

2. Costs of Change Orders taken from Contingency Allowance will be issued in accordance to Supplementary Conditions.

3. Credit the Owner with any unused portion of the Contingency Allowance in the statement for final payment.

End of Section

1. Project Meetings for Co-ordination

1. In consultation with the Consultant not later than the second week of construction, arrange for site meetings weekly or every 2 weeks as appropriate to the stage of construction, for project coordination. Such meetings shall fall at the same time each week the meeting is scheduled.

2. Responsible representatives of the Contractor's and Subcontractor's office and field forces and suppliers shall be obliged to attend.

3. Inform the Owner, Consultant, and those others whose attendance is obligatory, of the date of each meeting, in sufficient time to ensure their attendance.

4. Provide physical space for meetings, prepare an agenda, chair and record the minutes of each meeting. Relevant information must be made available to all concerned, in order that problems to be discussed may be expeditiously resolved. Identify "action by: _____".

5. Within three days after each meeting, distribute two copies of the minutes to each invited person.

2. Preconstruction Meeting

1. Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

2. Include in the agenda the following:

   .1 Appointment of official representative of participants in the Work.
   .2 Scheduling of Work. Schedule to include a detailed breakdown of mechanical and electrical works.
   .3 Interference with ongoing business.
   .4 Work by other Contractors.
   .5 Schedule of submission of shop drawings and samples.
   .6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities.
   .7 Delivery schedule of specified equipment.
   .8 Site security.
   .9 Contemplated change notices, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
   .10 Record drawings.
   .11 Maintenance manuals.
   .12 Take-over procedures, acceptance, warranties.
   .13 Monthly progress claims, administrative procedures, photographs, holdbacks.
   .14 Appointments of inspection and testing agencies or firms.

   .15 Insurances, transcript of policies.
   .16 Schedule for progress meetings.

3. Project Meetings for Progress of Work

1. Conduct progress meetings in accordance with the schedule and/or decisions made at Preconstruction meeting.

2. Inform the Owner, Consultant, project consultants, Subcontractors and suppliers and those whose attendance is obligatory, of the date of the meeting, in sufficient time to ensure their attendance.

3. Include in the agenda the following:

   .1 Review, approval of minutes of previous meeting.
   .2 Review of Work progress since previous meeting.
   .3 Field observations, problems, conflicts.
   .4 Problems which impede construction schedule.
   .5 Review of off-site fabrication delivery schedules.
   .6 Corrective measures and procedures to regain projected schedule.
   .7 Revisions to construction schedule.
   .8 Progress during succeeding work period.
   .9 Review submittal schedules: expedite as required.
   .10 Maintenance of quality standards.
   .11 Pending changes and substitutions.
   .12 Review proposed changes for effect on construction schedule and on completion date.
   .13 Other business.

4. Progress Records

1. Maintain a permanent written record on the site of the progress of the work using standard OGCA form. This record shall be available to the Consultant at the site, and a copy shall be furnished to same on request. The record shall contain:

   .1 Daily weather conditions, including maximum and minimum temperatures.
   .2 Dates of the commencement and completion of stage or portion of the work of each trade in each area of the project.
   .3 Conditions encountered during excavation.
   .4 Dates of erection and removal of formwork, in each area of the project.
   .5 Dates of pouring the concrete in each area of the project, with quantity and particulars of the concrete.
   .6 Work force on project daily per trade.
   .7 Visits to site by personnel of Consultant, Jurisdictional Authorities and testing companies.

End of Section

1. General

1. Submit to Architect, for review, shop drawings, product data and samples specified.

2. Until submission is reviewed, work involving relevant product must not proceed.

2. Shop Drawings

1. Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate Sections.

2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

3. Maximum sheet size 24” x 36” as a PDF file.

3. Project Data

1. Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.

2. Above will only be accepted if they conform to following:
   .1 Delete information which is not applicable to project.
   .2 Supplement standard information to provide additional information applicable to project.
   .3 Show dimensions and clearances required.
   .4 Show performance characteristics and capacities.
   .5 Show wiring diagrams (when requested) and controls.

4. Coordination of Submissions

1. Review shop drawings, product data and samples prior to submission.

2. Verify:
   .1 Field measurements.
   .2 Field construction criteria.
   .3 Catalogue numbers and similar data.

3. Coordinate each submission with requirement of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.

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

5. Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Architect's review of submission, unless Architect gives written acceptance of specified deviations.

6. Notify Architect, in writing at time of submission, of deviations from requirements of Contract documents.

7. After Architect's review, distribute copies.

5. Submission Requirements

1. Schedule submissions at least fourteen (14) days before dates that reviewed submissions will be required to be returned.

2. Submit a digital copy (PDF) of shop drawings, product data to Architect for review.

3. Accompany submissions with transmittal letter, in duplicate, containing:
   - .1 Date.
   - .2 Project title and number.
   - .3 Contractor's name and address.
   - .4 Number of each shop drawing, product data and sample submitted.
   - .5 Other pertinent data.

4. Submissions must include:
   - .1 Date and revision dates.
   - .2 Project title and number.
   - .3 Name of:
     - .1 Contractor.
     - .2 Subcontractor.
     - .3 Supplier.
     - .4 Manufacturer.
     - .5 Separate detailer when pertinent.

5. Identification of product or material.
   - .1 Relation to adjacent structure or materials.
   - .2 Field dimensions, clearly identified as such.
   - .3 Specification Section number.
   - .4 Applicable standards, such as CSA or CGSB numbers.
   - .5 Contractor's stamp, initialled or signed, certifying review of submission, verification of field measurements and compliance with Contract documents.

6. Interference Drawings
   - .1 Prepare interference drawings for all work in confined space ie: ceiling space.

End of Section

1. Access

1. Provide and maintain adequate access to project site. (See Section 01005).

2. Contractor's Site Office

1. Provide office heated to 22^{o}C, lighted 750 Lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table, telephone, and facsimile machine. Pay telephone not acceptable.

2. Maintain in clean condition.

3. Provide and maintain in clean condition: two separate plans layout tables, minimum 1200 x 1800 each. One table shall be used by the General Contractor and subcontractors at their discretion. The second shall be provided for use by subcontractors and by the consultant or Inspection and Testing Companies during site visits or project meetings.

3. Storage Sheds

1. Provide adequate weathertight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.

4. Sanitary Facilities

1. Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

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

3. When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval or Architect.

5. Parking

1. Provide, on site, sufficient temporary parking.

6. Site Enclosures

1. Site enclosure with modular fence hoarding.

2. Erect and maintain Public Way protection at sidewalks, including roof and side covers, complete with signs, as required by occupational health and Safety act and Regulations for Construction project Sections 64 and 65.
3. Paint public side of site enclosure in selected colors with one coat primer to CGSB 1-GP-55M and one coat exterior paint to CGSB 1-GP-59M+Amdt-Aug-84.

4. At least two (2) weeks prior to commencing work, submit design and supporting data.

5. Design and supporting data submitted to bear the stamp and signature of qualified professional engineer registered in the province of Ontario.

6. Professional engineer responsible for design of temporary structures to submit proof of insurance coverage for professional liability, except where engineer is employee of contractor, in which case contractor shall submit proof that work by professional engineer is included in contractor's insurance coverage.

7. General Contractor to engage qualified shoring contractor to perform all shoring work as designed by shoring engineer.

7. Enclosure of Structure

1. Provide temporary weathertight enclosures protection for exterior openings until permanently enclosed.

2. Erect enclosures to allow access for installation of materials and working inside enclosure.

3. Design enclosures to withstand wind pressure.

8. Power

1. Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

2. Install temporary facilities for power such as pole lines and underground cables to approval of local power supply authority.

3. Electrical power and lighting systems installed under this Contract may be used for construction requirements with prior approval of Architect, provided that guarantees are not affected. Make good damage. Replace lamps which have been used over period of three (3) months.

9. Water Supply

1. Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances.

10. Drainage

1. Refer to Section 01575 for site drainage and pumping requirements.

11. Jobsite Sign

1. Supply and erect a 2400H x 1200W mm sign (W.P. Plywood Signboard).

2. Construct plumb and level in neat wood framework and securely anchored in ground by posts to withstand wind pressure of 160 km/h.

3. Architect will supply layout.

12. Scaffolding

1. Erect Scaffolding to maintain pedestrian traffic flow along King Street. Scaffolding design must meet approval of City of Hamilton Public Works Department.

13. Heat and Ventilating

1. Pay for cost of temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approvals given by the Architect.

2. Furnish and install temporary heat and ventilation in enclosed areas, as required to:
   .1 Facilitate progress of work.
   .2 Protect work and products against dampness and cold.
   .3 Prevent moisture condensation on surfaces.
   .4 Provide ambient temperatures and humidity for storage, installation, curing of materials.
   .5 Provide adequate ventilation to meet health regulations for safe working environment.

3. Maintain minimum temperature of 10 degrees C or higher where specified as soon as finishing work is commenced and maintained until acceptance of structure by Engineer.

4. Ventilating:
   .1 Prevent hazardous accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
   .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
   .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
   .4 Ventilate storage spaces containing hazardous or volatile materials.
   .5 Ventilate temporary sanitary facilities.
   .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.

5. Maintain strict supervision of operation of temporary heating and ventilating equipment to:
   .1 Conform with applicable codes and standards.
   .2 Enforce safe practices.
   .3 Prevent abuse of services.
   .4 Prevent damage to finishes.
   .5 Vent direct -fired combustion units to outside.

6. The Architect may permit the use of permanent system providing agreement can be reached on:
    .1 Conditions of use, special equipment, protection and maintenance.
    .2 Guarantees will not be affected.
    .3 Approval of the Owner.

End of Section

1. Construction Safety Measures

1. Observe and enforce construction safety measures required by the National Building Code; the O.B.C.; The Provincial Government; Workers' Compensation Board; and, Municipal authorities.

2. In particular, the Occupational Health and Safety Act (Ont. Re. 213/91), the Occupational Health and Safety Act, the regulations of the Ontario Ministry of Labour and Ontario Hydro Safety requirements shall be strictly enforced.

3. Contractor shall ensure that copies of all applicable construction safety regulations, codes and standards are available on the job-site throughout the period of construction. All workers are to be informed that these documents are available for reference at any time.

4. The Contractor shall ensure that all supervisory personnel on the job-site are fully aware of the contents of the Occupational Health and safety Act (Ontario Regulation 213/91 - Construction Projects) the Workers' Compensation Act" and, Bill 208 (Chapter 7, Standards of Ontario) “An Act to Amend the Occupational Health & Safety Act and the Workers’ Compensation Act”, and, that they comply with all requirements and procedures prescribed therein. These documents include, but are not limited to, the following construction safety requirements:

    .1 Contractor to register with the Director of the Occupational Health and Safety Division before or within 30 days of the commencement of the project, (O.Reg. 213/91, sec 5).
    .2 File a notice of project with a Director before beginning work on the project, (O.Reg 313/91, sec 6).
    .3 Notification prior to trenching deeper than 1.2m, (O.Reg. 213/91, sec 7).
    .4 Accident Notices and Reports, (O.Reg. 213/91, sec 8 through sec 12).
    .5 General Safety Requirements, (O.Reg. 213/91, sec 13 through sec 19).
    .6 General Construction Requirements, e.g. protective clothing, hygiene practices, housekeeping, temporary heat, fire safety, access to the job-site, machine and equipment guarding and coverings, scaffolds and platforms, electrical hazards, roofing, et al, (O.Reg. 213/91, sec 20 through sec 221).
    .7 Establish a Joint Health and Safety Committee where more than 19 workers are employed for more than 3 months, (Bill 208, S.8(2) to S.8(14).
    .8 Establish a Worker Trades Committee for all projects employing more than 49 workers for more than 3 months, (Bill 208, S-8a(1) to S.8b(4).
    .9 Ensure that all activities arising out of (.07) and (.08) above are recorded and that minutes are available to an inspector of the Ontario Ministry of Labour.

5. The Contractor shall be considered as the "Constructor" in consideration of the rights and responsibilities for all construction safety requirements, procedures, facilities and inspection of all work performed by the Contractor, Subcontractors/Sub-trades and other Contractors engaged on this project.

6. In the event of a conflict between any of the provisions of the above authorities the most stringent provisions are to be applied.

2. Material Safety Data Sheet

1. Material safety Data Sheets (MSDS) must be available at the job-site for any product listed on the Hazardous Ingredients List prior to being used, installed or applied inside of the building.

2. A Material Safety Data Sheet is to be submitted to the Architect for any product which is known to create, or suspected of creating, a health hazard or discomfort during construction or upon commissioning of the project including, but not limited to, the following:

   .1 adhesives
   .2 solvents
   .3 sealants, (caulking, vapour seals, etc.)
   .4 sprayed-on fireproofing
   .5 resilient flooring
   .6 carpet, paint, varnish or other coatings
   .7 exposed membrane waterproofing
   .8 special coatings, (terrazo sealants, chafing coatings, etc.)
   .9 solder, brazing and welding and other filler metal
   .10 other products whose particles or vapours may become air borne after installation.
   .11 any other product as directed by the Consultant.

3. Comply with WHMIS regulation, Workplace Hazardous Material Information System.

3. Fire Safety Requirements

1. Comply with requirements for Building Construction, the Ontario Building Code, the Ontario Fire Code, the requirements of Local Fire Authorities and of the requirements of the Office of the Fire Marshal.

4. Overloading

1. Ensure no part of Work is subjected to a load which will endanger its safety or will cause permanent deformation.

5. Falsework

1. Design and construct falsework in accordance with CSA S269.1-1975.

6. Scaffolding

1. Design and construct scaffolding in accordance with CSA S269.2-M1980.

2. Scaffolding to be designed by a Professional Engineer when required under the Occupational Health and Safety Act.

7. Materials Specifically Excluded

1. Asbestos and/or asbestos-containing products are not permitted. Submit Material Safety Data Sheets for any product suspected of containing asbestos if so requested by

Consultant. Examples of some materials requiring close scrutiny and/or confirmation include:

.1 Transite drainage pipe - whether buried or above grade - not permitted.
.2 Composite floor tile containing asbestos - not permitted.
.3 Lay-in ceiling tiles containing asbestos - not permitted.
.4 Insulation and/or jacketing for pies, ducts, motors, pumps, etc. - not permitted if any asbestos is present.

2. Solder for all piping is to be lead-free.

.1 "Lead Free" shall mean solder which contains less than 0.030% of lead when dissolved in fluoroboric and nitric acids and tested by inductively coupled argon plasma atomic emission spectroscopy. "Steelbond 281" and "Siverbrite" are acceptable solder products.
.2 The mechanical contractor shall provide an affidavit signed by the Principal of the company, on company letterhead, that all of the solder used on the project was either one of the two acceptable products or that the solder used (identified by brand name) meets or exceeds the testing criteria.
.3 The Owner shall undertake random testing of the soldered joints. Should testing prove that the solder used was not as specified, the Owner shall take action against the contractor to the full extent of the law.

3. All paint and finish coatings are to be lead and mercury-free. Submit Material Safety Data Sheets confirming that these products are free of all lead and/or mercury compounds.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. These specifications apply to all 16 divisions of the project specification. It is the responsibility of the contractor to apply these provisions wherever practical within specification limits to all products and services used on this project.

2. Recognized that currently specified materials and methods may conflict with the basic intention of this section. Where reasonable alternate materials and methods exist that are not specified here, and that do not compromise quality or create additional cost for the owner, notify the Architect of such alternate materials or methods. Do not proceed to use alternate materials or methods to those specified without the express approval of the Architect.

3. Elsewhere, apply the provisions of this section to all work. Exceptions can only be made when signed off by the Architect. Suitability of all products used is the responsibility of the contractor.

1.2 Compliance Specifications

1. The contractor must comply with all applicable health, safety and environmental regulations.

1.3 Beyond Compliance Specifications

1. These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Owner's intention to develop a specification which maximizes environmentally "friendly" materials and methods wherever possible within current technical and budget limitations.

2. Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore these specifications cover both material and methods.

3. The primary goal of beyond compliance specification is to reduce the use of products or methods which have negative health and environmental impacts both during and after construction. These considerations may include full life cycle impacts, associated with raw materials, manufacturing, transport, deconstruction and their eventual fate.

4. These specifications will specifically address primary categories of readily identifiable products, ingredients and methods.

5. These provisions apply to both indoor and outdoor applications equally.

1.4. Exceptions

1. These specifications recognize that not all substitutes are equal and therefore exceptions can be made based on substantive evidence of necessary and superior performance. Special considerations may be given to restricted substances when secondary provisions are made such as sealed in place (contained) applications. All such exceptions must be approved in writing by the Architect.

PART 2 - MATERIALS

2.1 Products or Substances to be Avoided or Limited in Use

1. No product containing the following substances may be used on this project when an equivalent product without or with a lower concentration of this substance is suitable and available. All products containing substances which are known to cause health effects including but not limited to cancer, mutagenic, neurological, or behavioral effects should be avoided if suitable substitutes not containing or containing lower concentrations are available. This provision shall be limited to information contained on Material Safety Data Sheets, therefore MSDS sheets must be reviewed for all products for which such sheets are required. Applications for exceptions must be accompanied by related MSDS and product application and performance sheets, clearly showing a need for the exception.

2.2 Volatile Organic Compounds

1. No product containing volatile organic compounds (in over simplified terms volatile petro chemical or similar plant derived solvents) may be used on this project when a suitable non VOC or failing that a low VOC substitute is available. Manufacturers may refer to the U.S. EPA definition of VOC's for guidance or alternatively use the low molecular weight organic compound descriptor.

   Example: Paints, Coatings, Primer, Adhesives, Chalks, Firestops, etc.

2. Waterborne equivalents are available for most of the solvent borne products used in construction and in most cases would be the preferred alternative. Waterborne products may in some instances have high VOC contents, therefore the fact that a product is waterborne does not automatically make it acceptable.

2.3 Chlorinated Substances

1. Poly Vinyl Chloride (vinyl) and other chlorinated products should be avoided if suitable substitutes are available.

2.4 Plasticizers

1. Plasticisers which offgass (low molecular weight) should be avoided.

2.5 Man Made Mineral Fibres

1. Products containing mineral fibres which can be emitted or abraded should be avoided.

   Examples: duct liner, mineral fibre ceiling tiles, etc.

2.6 Radiation

1. Products or methods which result in the lowest emission of Electro Magnetic Fields are preferred.

2.7 Biocides

1. Products containing biocides (pesticides, miticides, mildeweides. fungicides, rodenticides, etc.) are not to be used if suitable alternatives are available. Highly stable, low human toxicity biocides such as Portercept may be acceptable substitutes. Biocide formulas which break down, emit powders of offgass should be avoided.

2.8 Heavy Metals

1. Heavy metals such as lead, cadmium, mercury etc. should be avoided.

2.9 Aluminum

1. Raw aluminum should be avoided, anodized or factory painted aluminum is acceptable. This is particularly applicable to surfaces which people can touch.

2.10 Ozone Depleting Substances

1. Products which contain or which use Ozone Depleting Substances such as Bromide, Chlorofluorocarbons (CFC) or Hydrofluorocarbons (HFC) etc. should be avoided if suitable substitutes are available.

2.11 Greenhouse Gasses

1. Products which contain, use or generate Greenhouse gasses such as CO2 should be avoided if suitable substitutes are available.

2.12 Bituminous (tar) Products

1. Products containing tar compounds should not be used if suitable substitutes are available.

2.13 Chemical Compounds

1. Products containing the following chemical compounds should not be used if suitable substitutes are available: Neoprene, Latex, Butyl, ABS, Formaldehyde.

2.14 Adhesives

1. Adhesives containing solvents or other non preferred ingredients should be avoided if suitable substitutes are available, including systems designs which do not need adhesives or can use mechanical etc. fastening alternatives

2.15 Composite Products

1. Some composite products contain adhesives such as formaldehyde which are not preferred, and some composites such as Fibre Reinforced Plastics are not practical for recycling. These products should be avoided if suitable substitutes are available.

2.16 Cleaners and Solvents

1. Products, equipment, and methods which require the use of cleaners and solvents are not preferred if suitable substitutes are available. Examples of preferred products would include No Wax floors, or primerless caulks and adhesives, or products not requiring caulks and adhesives.

End of Section

1. Fires

1. Fires and burning of rubbish on site is not permitted.

2. Disposal of Wastes

1. Do not bury rubbish and waste materials on site.

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

3. Drainage

1. Provide temporary drainage and pumping, as necessary to keep excavations and site free from water.

2. Do not pump 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.

4. Site Clearing and Plant Protection

1. Protect trees and plants on site and adjacent properties, which are to be retained.

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 2 m.

3. Protect roots of trees to drip line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

End of Section

1. General

1. Refer also to Section 01005, item 5.12 'Period Cleaning' and coordinate with this section.

2. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

3. Store volatile wastes in covered metal containers, and remove from premises daily.

4. Prevent accumulation of wastes which create hazardous conditions.

5. Provide adequate ventilation during use of volatile or noxious substances.

2. Materials

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

2. Provide on-site dump containers for collection of waste materials, and rubbish.

3. Remove waste materials, and rubbish from site.

4. Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

5. Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

3. Cleaning During Construction

1. Maintain project grounds, and public properties free from accumulations of waste materials and rubbish. Clean streets as often as required by the local authorities.

2. Provide on-site containers for collection of waste materials, and rubbish.

3. Remove waste materials, and rubbish from site.

4. Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

5. Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

4. Final Cleaning

1. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all surfaces exposed to view; leave project clean and ready for occupancy.

2. Employ experienced workers, or professional cleaners, for final cleaning.

3. In preparation for Substantial Performance or Fitness for Occupancy, whichever occurs first, conduct final inspection of interior and exterior surfaces exposed to view, and of concealed spaces.

4. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all sight-exposed interior and exterior finished surfaces; polish resilient and ceramic surfaces so designated to shine finish. Vacuum carpet.

5. Clean and polish glass and mirrors.

6. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.

7. Broom-clean paved surfaces; rake clean other surfaces of grounds.

8. Clean exposed ductwork, and structure.

9. Replace filters.

10. Clean bulbs and lamps and replace those burned out.

11. Clean diffusers and grilles.

12. Clean sinks, faucets, and water closets and controls.

13. Remove snow and ice from access to building, if applicable.

14. Maintain cleaning until project, or portion thereof, is occupied by Owner.

5. Removal of Temporary Facilities

1. Completely remove temporary facilities from site, including signs and foundations, making good any damage when no longer required.

End of Section

PART 1 - GENERAL

1. Requirements Included

1. Record documents, samples, specifications.

2. Equipment and systems.

3. Product data, materials and finishes, and related information.

2. Quality Assurance

1. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

3. Format

1. Organize data in the form of an instructional manual.

2. Binders: commercial quality, (8-1/2 x 11 inch) 219 x 279 mm maximum (2-1/2”) 65 mm ring size.

3. When multiple binders are used, correlate data into related consistent groupings.

4. Cover: Identify each binder with type or printed title “Project Record Documents”, list title of Project, identify subject matter of contents.

5. Arrange content under Section numbers and sequence of Table of Contents.

6. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

7. Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

4. Contents, Each Volume

1. Table of Contents: Provide title of project; names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

2. For each Product or System: list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

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

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

5. Typed Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

5. Submission

1. Submit for review a digital pdf file of completed closeout documents in final form 15 days prior to substantial performance. For equipment put into use with Owner's permission during construction, submit Operating and Maintenance Manuals within 10 days after start-up. For items of Work delayed materially beyond date of Substantial Performance, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

2. Consultant comments will be returned and the contractor is to revise content of documents as required prior to final submittal.

3. Submit one copy of revised volumes of data in final form within 10 days after final inspection.

4. For contract drawings (architectural, structural, mechanical, and electrical), transfer neatly as-built notations onto second set and submit both sets.

5. Prepare digital pdf file for submission on USB of completed closeout documents.

6. Record Documents and Samples

1. In addition to requirements in Sections 00820 and 01005, maintain at the site for Owner one record copy of:
   .1 Contract Drawings.
   .2 Specifications.
   .3 Addenda
   .4 Change Orders and other modifications to the Contract.
   .5 Reviewed shop drawings, product data and samples.
   .6 Field test records.
   .7 Inspection certificates.
   .8 Manufacturer's certificates.

2. Store Record Documents and Samples in Field Office apart from documents used for construction. Provide files, racks, and secure storage.

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

4. Maintain Record Documents in a clean, dry, and legible condition. Do not use Record Documents for construction purposes.

5. Keep Record Documents and samples available for inspection by Consultant.

7. Recording As-Built Conditions

1. Consultant will provide digital pdf copy of project drawings. Contractor to mark and record one set on an on-going basis as construction proceeds. **Near the end of the construction period transfer all marks neatly to second set for submission as project record documents.**

2. Refer to drawings/specifications for additional mechanical and electrical requirements.

3. Record information concurrently with construction progress. Do not conceal work until required information is recorded.

4. Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
    .1 Measure depths of elements of foundation in relation to finish first floor datum.
    .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
    .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
    .4 Field changes of dimension and detail.
    .5 Changes made by change orders.
    .6 Details not on original Contract Drawings.
    .7 References to related shop drawings and modifications.

5. Specifications: legibly mark each item to record actual construction, including:
    .1 Manufacturer, trade name, and catalog number of each project actually installed, particularly optional items and substitute items.
    .2 Changes made by Addenda and Change Orders.

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

8. Digital As-Built Drawings

1. Retain the services of a CAD drafting company acceptable to the consultant to prepare digital CAD As-Built documents for all Architectural and Engineering drawings.

2. After the consultant has found the Redlined As-Built drawings to be acceptable, transfer to digital file all information recorded on As-Built drawings. Layering of information as per consultant's instructions.

9. Equipment and Systems

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

2. Panelboard Circuit Directories: provide electrical service characteristics, controls, and communications.

3. Include installed colour coded wiring diagrams.

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

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

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

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

8. Include sequence of operation by controls manufacturer.

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

10. Provide installed control diagrams by controls manufacturer.

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

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

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

14. Include test balancing reports as specified in Mechanical Specifications.

15. Additional Requirements: As specified in individual specification sections.

10. Materials and Finishes

1. Building Products, Applied Materials, and Finishes: include product data, with catalog number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

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

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

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

11. Guarantees, Warranties and Bonds

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

2. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal. Use Guarantee/Warranty Form as provided in Section 01721 whenever standard preprinted trade or manufacturer's Guarantee/Warranty forms are not available. Provide written form for each warranty specified in Section 01740.

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

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

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

6. Co-execute submittals when required.

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

End of Section

1. Notes

1. To be made out on the letterhead of Guarantor or Warrantor which usually is a Subcontractor.

2. This format is to be used only when standard preprinted trade or manufacturer's forms are not available. Preprinted forms are to include all elements of information shown on this sample or as a minimum.

3. Comply with Requirements for Guarantee/Warranty as specified in Section 01720, Article 10.

To:
Date: _____

SECTION _____

TITLE _____

GUARANTEE/WARRANTY TO:

OWNER	THE ROMAN CATHOLIC DIOCESE OF ST. CATHARINES
PROJECT	Cathedral of St. Catherine of Alexandria: Columbarium Renovation
ARCHITECT	Grguric Architects Incorporated
REFERENCE	(to specifications or drawings)
TIME	Period of Guarantee/Warranty:_____ years
GUARANTEE/ WARRANTY	Starting Date: Substantial Performance as certified by Architect Date: _____

(Description of Guarantee/Warranty)

_____
_____
_____
_____

Upon written notification from the Owner or the Consultant that the above work is defective any repair or replacement work required shall be to the Consultant's satisfaction at no cost to the Owner.

This guarantee shall not apply to defects caused by the work of others, maltreatment of materials, negligence or Acts of God.

_____

SUBCONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer: _____
(Name Printed)

_____
Title

Name of Firm: _____

Address: _____

Telephone Number _____

CONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer: _____ _____
(Name Printed)

_____
Title

Name of Firm: _____ SEAL

Address: _____

Telephone Number _____

End of Section

1.1 Maintenance Manuals

1. On completion of project, submit to Architect one (1) copy of Operations Data and Maintenance Manual in English, made up as follows:

    .1 Bind data in vinyl hard covered, 3 ring loose leaf binder for 215 x 280 mm size paper.
    .2 Enclose title sheet, labelled "Operation Data and Maintenance Manual", project name, date and list of contents.
    .3 Organize contents into applicable sections of work to parallel project's specification break-down. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.
    .4 A digital copy of all documents in the manuals must be provided on memory stick USB, format to be PDF.

2. Include following information, plus data specified.

    .1 Maintenance instructions for finished surface and materials.
    .2 Copy of hardware and paint schedules.
    .3 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.
    .4 Names, addresses and phone numbers of sub-contractors and suppliers.
    .5 Guarantees, Warranties and bonds showing:
        .1 Name and address of project.
        .2 Guarantee commencement date (date of Final Certificate of Completion).
        .3 Duration of guarantee.
        .4 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
        .5 Signature and seal of Contractor.
        .6 Additional material used in project listed under various Sections showing name of manufacturer and source of supply.

3. Neatly type lists and notes. Use clear drawings, diagrams or manufacturers' literature.

4. Include in the Manuals a complete set of final shop drawings indicating corrections and changes made during fabrication and installation.

End of Section

1. Standard Warranty

1. Refer to Section 01721 'Sample Guarantee/Warranty Form for Warranty requirements and conditions for the standard warranty which is required for the work of this contract. Refer to Section Supplementary Conditions and to Standard Contract Document for warranty requirements and conditions for the standard warranty which is required for the work of this contract.

2. Extended Warranties

1. Refer to individual specifications sections for requirements of extended warranties required for particular sections or items of work.

2. Extended warranties are required to be issued by manufacturers, fabricators, suppliers and/or installers, sometimes jointly, due to their unique position in the construction process and their ability to guarantee a particular section of work. Refer to individual requirements of extended warranties requested.

3. Unless specifically noted otherwise, all extended warranties shall commence on the date of Substantial Performance of the Work as certified by the Consultant.

4. Listed below is a summary of extended warranties required for individual Sections. This list, if inconsistent with the specified requirements of individual extended warranties, shall be deemed correct with respect to length of extended warranties. Extended warranties required shall include, but not be limited to, the following:

   .1 Extended warranties (total warranty period listed, including entire building warranty)

Cementitious Fireproofing (Section 07250)	2 years
Caulking (Section 07900)	2 years
Steel Doors and Frames (Section 08100)	refer to section
Wood Doors (Section 08210)	1 year
Glazing (Section 08800)	2 years
Floor Porcelain tiles (Section 09330)	3 years
Carpeting (Section 09680	refer to section
Painting (Section 09900)	2 years

End of Section

PART 1 - GENERAL

1.1 Related Work Specified Elsewhere

1. Temporary Facilities: Section 01500

1.2 Existing Conditions

1. Take over structures to be demolished based on their conditions (on date that tender is accepted).

1.3 Demolition Drawings

1. Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details clearly showing sequence of disassembly work or supporting structures.

1.4 Protection

1. Prevent movement, settlement or damage of adjacent grades. Provide bracing, shoring as required.

2. Prevent debris from blocking surface drainage inlets which must remain in operation.

3. Protect existing items designated to remain and materials designated for salvage. In the event of damage to such items, immediately replace or make repairs to approval of Owner and at not cost to Owner.

PART 2 - PRODUCTS

1. Not applicable.

PART 3 - EXECUTION

3.1 Work

1. Dispose of demolished materials except where noted otherwise.

3.2 Safety Code

1. Unless otherwise specified, carry out demolition work in accordance with Canadian Construction Safety Code 1980.

2. Should material resembling spray or trowel-applied asbestos be encountered, notify Architect. Any asbestos encountered will be removed by the Owner's Contractor.

3.3 Preparation

1. Disconnect electrical and telephone service lines entering areas to be demolished as per rules and regulations of authorities having jurisdiction. Post warning signs on electrical

lines and equipment which must remain energized to serve other areas during period of demolition.

2. Inspect site and rectify with Architect items designated for removal and items to remain.

3. Disconnect and cap mechanical services in accordance with requirements of local authority having jurisdiction.

4. Natural gas supply lines to be removed (by gas company) (by qualified tradesman in accordance with gas company instructions).

3.4 Demolition & Field Work

1. Demolish areas as indicated on the drawings.

2. Remove existing equipment, services and obstacles, where required, for refinishing or making good of existing surfaces, and replace same as work progresses.

3. At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements at all times).

4. Demolish in a manner to minimize dusting. Keep dusty materials wetted.

5. Demolish masonry and concrete walls in small sections. Carefully remove and lower structural framing and other heavy or large objects.

6. Burning materials on site is not permitted.

7. Remove contaminated or dangerous materials from site and dispose of in safe manner.

8. Employ rodent and vermin exterminators to comply with health regulations.

3.5 Salvage

1. Carefully dismantle items containing materials for salvage and stockpile salvaged materials at locations as directed by Architect.

3.6 Restoration

1. Upon completion of work, remove debris, trim services and leave work site clean.

2. Reinstall areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

3.7 Demolition Field Work

1. Disconnect electrical and telephone service lines entering building where selective demolition taking place in accordance with authorities having jurisdiction. Post warning signs on electrical lines and equipment remaining energized during period of construction.

2. Protect existing natural gas supply line, above grade connection at building exterior and to lines in building interior for incorporation into completed natural gas supply system.

3. Remove and dispose of all underground services which are not incorporated into the finished work.

4. Demolish and remove all portions of foundation walls and footings below finished floor level or lowest asphalt elevation where existing walls above grade are demolished.

5. Ensure no water accumulation occurs in sections of building to remain after selective demolition completed. Maintain existing sewer systems and drainage for building during construction. Keep floor and roof drains open until area covered by new construction or adequate alternate means of drainage provided.

6. Pieces of concrete and masonry not larger than 250 mm broken from demolition work may be used as backfill in open excavations provided voids are filled. Keep demolition fill 800 mm below finished grade level unless otherwise noted in Geotechnical report.

7. Remove all existing equipment, services and obstacles where required for refinishing or making good of existing surfaces.

8. At the end of each day's work, leave work in safe condition so that no part is in danger of falling or toppling. Protect interiors of parts not to be demolished from exterior elements at all times.

9. Demolish masonry in pieces not larger than 1000 x 1000 mm.

10. Protect existing structural framing. Protect sections of existing masonry bearing walls for minimum 400 mm on each side of centreline of bearing. Carry out demolition of adjacent masonry in a manner which does not threaten structural integrity of masonry to remain.

11. Do not demolish existing beams or posts unless noted in Drawings. Inform Architect where posts are uncovered in areas where selective demolition is to take place. Await instructions.

12. Pump out any buried tanks and remove.

13. Remove all exterior exit door screens indicated on drawings for demolition.

14. Remove existing windows to minimize breakage.

15. Demolish sections of spandrel panels beneath existing window openings where shown on Drawings with edges as straight, vertical lines to provide constant rough opening size for

doors to be installed. Protect adjacent sections of spandrel panels to remain from vibration and movement that would undermine structural integrity.

16. Remove, protect and store, in area designated by owner, mechanical and electrical materials to be retained by owner.

17. Demolish selected areas of masonry within masonry exterior finishes to remain using straight line to nearest existing masonry joint. Ensure adequate temporary support for masonry above opening to remain until lintel installed.

18. Adjust locations of openings to be demolished, interior and exterior, in order to start at existing openings. Where more than one opening is to be made adjacent in existing masonry, ensure length of masonry remaining between opening is minimum 810 mm in length with straight, saw-cut vertical joints.

19. Remove all existing roofing, insulation, and vapour barrier down to decking in areas designated. Leave deck free from fasteners, blocking, flashings, and roof accessories. Provide protection for exposed decking form the elements. Do not bend or dent metal decking from which roofing removed.

20. Where filling in an existing opening use tooth method if opening is located in a public area. All openings above finished ceiling material do not require this method of filling.

3.8 Scheduling

1. Demolition of areas adjacent to occupied spaces may not occur during occupancy of these spaces. Contractor to schedule the demolition of these areas to occur after hours or weekends.

End of Section

PART 1 - GENERAL

1.1 General Requirements

1. Division One, General Requirements is part of this Section and shall apply as if repeated here.

1.2 Related Work Specified Elsewhere

1. Excavation, Backfilling and Rough Grading — Section 02220

1.3 Examination

1. Examine the Drawings, Specifications, and Bore Hole data which shows soil conditions at boreholes in locations shown on Drawings. Visit the site and determine the work extent and nature of the existing conditions. In no circumstances will any claims against the Owner be allowed resulting from failure to ascertain the work herein described or implied.

2. Report to the Consultant in writing any conditions which will prejudice the proper completion of the work of this Section. Commencement of work constitutes acceptance of existing conditions.

1.4 Protection

1. Establish locations of all electrical, telephone, or other service installations existing in the areas of site preparation by contacting the service owners and obtaining their approval to work in such areas. Contact the City of Burlington and local utilities, to review proposed scheduling, work activities and regulations pertaining to all work beyond the limits of the property including but not limited to parking areas, stormwater outlet and headwall and asphalt driveway entrances. Provide adequate markers or take protective measures to ensure that no damage will be caused under this Section. Repair or replace damaged work as required without cost to the Owner.

2. Electronically locate, map and record location of services prior to doing any excavation.

1.5 Dust Control

1. Provide and maintain to the Consultant’s satisfaction, adequate system to avoid any nuisance caused by dust and dirt rising throughout the area of operations.

1.6 Silt Control

1. Provide and maintain to the Consultant’s satisfaction, control systems to prevent silt from entering any storm drainage system.

PART 2 - PRODUCTS

2.1 Materials

1. Not Applicable.

PART 3 - EXECUTION

3.1 Disposal of Waste and Surplus Materials

1. Except where specified or indicated on Drawings to be retained on site, or to be reused, remove from the site, all waste and surplus materials resulting from site preparation work on a daily basis. Dispose of as required in accordance with local or provincial regulations. Under no circumstances shall the burning of rubbish be permitted on the site. Where items are to be reused, store on site where designated and provide temporary protection to same to prevent damage by construction operations.

2. Excavation material is required to be trucked off site.

End of Section

PART 1 - GENERAL

1.1 Related Work Specified Elsewhere

1.	Excavation and Backfill for Mechanical and Electrical:	refer to Drawings
2.	Safety Requirements:	Section 01545
3.	Environmental Protection:	Section 01575
4.	Weeping Tile Drainage:	Section 02411

1.2 Shoring, Bracing & Underpinning

1. Prevent movement or settlement, safeguard and maintain integrity of adjacent structures, earth, bench marks, services, walks, paving, trees, bearing piles, curbs, landscaping, adjacent grades. Provide bracing, shoring and underpinning required.

2. Shore and brace excavations to prevent failure in accordance with Canadian Construction Safety Code 1977 and applicable local regulations.

3. Make good and pay for any damage and be liable for any injury resulting from inadequate shoring, bracing or underpinning.

4. Comply with all Safety Requirements and applicable local regulations and to protect existing features.

5. Engage services of qualified professional engineer who is registered in the province or territory in which work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for work.

1.3 Utility Lines

1. Before commencing work, establish location and extent of underground utility lines in area of excavation. Notify Architect of findings.

2. Known underground and surface utility lines and buried objects are indicated on site plans. No guarantee is given of completeness and accuracy.

3. Make good and pay for damage to existing utility lines resulting from work.

1.4 Protection

1. Protect bottoms of excavations from softening. Should softening occur, remove softened soil and replace with footing concrete.

2. Protect bottoms of excavations from freezing.

3. Construction banks in accordance with local by-laws.

4. Provide adequate protection around bench markers, layout markers, survey markers, and geodetic monuments.

5. Provide protection to ensure no damage to existing facilities and equipment situated on site.

6. Effect approved measures to minimize dust as a result of this work.

7. Do not stockpile excavated material to interfere with site operation or drainage.

1.5 Compaction Densities

1. Compaction densities are percentages of maximum densities obtainable from ASTMD698-70.

PART 2 - PRODUCTS

2.1 Materials

1. **Type 1 Fill:** Clean, graded 20 mm clear crushed stone.

2. **Type 2 Fill:** Clean, natural river sand and gravel material, free from silt, clay, loam friable or soluble materials and organic matter, graded within the limits of MTC granular class “B” material.

3. **Type 3 Fill:** Concrete backfill 15 Mpa strength at 28 days complying with the requirements of Section 03300.

4. **Type 4 Fill:** Excavated pervious soil free from roots, rocks larger than 75 mm and building debris. If sufficient quantity of material is not available from excavation, use imported fill having same or better characteristics.

5. **Type 5 Fill:** Fine grain material such as clay, that is relatively impervious to the flow of water.

2.2 Stockpiling

1. Stockpile fill materials in areas designated by Architect. Stockpile granular materials in manner to prevent segregation. Protect stockpiled fill material from freezing.

2. Protect fill materials from contamination.

PART 3 - EXECUTION

3.1 Preparation

1. **Lines and Levels:** Establish accurate lines and levels as required. Supply batter board, line stakes and templates. Establish permanent reference lines and bench marks required.

3.2 Excavating

1. Excavate to elevations and dimensions indicated for installation, construction and inspection of work.

2. Excavate to well defined lines to minimize quantity of fill material required.

3. Earth bottoms of excavations to be dry, undisturbed soil, level, free from loose or organic matter.

4. Excavation must not interfere with normal 45 deg. splay of bearing from bottom of any footing.

5. When complete, have Architect inspect excavations to verify soil bearing capacity, depths and dimensions.

6. Excavation, exceeding that indicated in Contract Documents, if authorized in writing by Architect, will be paid as extra to Contract Price in accordance with General Conditions.

7. Correct unauthorized excavation at no extra cost as follows:
   .1 Fill under bearing surfaces and footings with type 3 fill.
   .2 Fill under other areas with Type 2 fill compacted to 98% density.

8. Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw. Seal cuts with approved tree wound dressing.

9. Remove paving, walks, rubble and other obstructions encountered in course of excavation.

10. Refer to site plan drawing for extent of existing stone foundation walls to be removed.

11. Remove all rubble and debris within perimeter of existing foundation walls.

3.3 Backfilling

1. Do not commence backfilling until areas of work to be backfilled have been inspected and approved by Architect.

2. Areas to be backfilled must be free from debris, snow, ice, water or frozen ground.

3. Prior to placing fill under slabs on grade, compact existing subgrade to obtain same compaction, as specified for fill. Remove “soft” material and fill with approved material.

4. Prior to installation of foundations compact existing subgrade to obtain bearing capacity. Remove soft material and fill with approved material.

5. Backfill simultaneously each side of walls and other structures to equalize soil pressures.

6. Obtain Architect’s approval prior to placing backfill against basement walls.

7. Where temporary unbalanced earth pressures are liable to develop on walls or the structures, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Architect.

8. Place and compact fill materials in continuous horizontal layers not exceeding 200 mm loose depth. Do not disturb or damage buried services, drainage system, waterproofing and dampproofing. Make good any damage.

9. Do not use frozen material for backfilling or filling.

3.4 Fill Locations & Compaction

1. **Type 1 Fill:**
   - .1 Use under interior concrete slabs on grade to a minimum compacted depth of 200 mm.
   - .2 Use under all exterior concrete slab on grade to a minimum compacted depth of 150 mm.
   - .3 Compact to at least 98% standard proctor maximum dry density.

2. **Type 2 Fill:**
   - .1 Use within building area, in trenches, pits and fill for over-excavated areas to underside of type 1 Fill.
   - .2 Compact to at least 98% standard proctor maximum dry density.

3. **Type 3 Fill:**
   - .1 Use under foundations where specified.

4. **Type 4 Fill:**
   - .1 Use at exterior side of perimeter walls to subgrade level.
   - .2 Use on backside of retaining walls to subgrade level on high side for minimum 500 mm from wall. Compact to 85% standard proctor maximum dry density.

5. **Type 5 Fill:**
   - .1 Use at perimeter of building at weeping tile location, above type 2 fill, in landscaped areas prior to placing top soil see Section 02411.

3.5 Grading

1. Rough grade to levels, profiles, and contours allowing for surface treatment as indicated. Under paved areas, subgrade must be properly shaped and crowned to provide drainage of the sub-base to the catch basins and to the sub-drainage system. Cross fall to be 2% minimum.

2. Slope rough grade away from building 1:50 minimum.

3. Grade ditches to depth required for maximum run-off.

4. Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Moisture content of fill and existing surface to be approximately the same to facilitate bonding.

5. Compact filled and disturbed areas to standard proctor maximum dry density to ASTM D698-78 as follows:
   .1 85% under landscaped area.
   .2 98% under paved and walk areas and under sports field.

6. Do not disturb soil within branch spread of trees or shrubs to remain.

3.6 Inspection & Testing

1. Refer to Section 01005.

3.7 Surplus Material

1. Dispose of surplus material from site.

End of Section

PART 1 - GENERAL

1.1 Related Work Specified Elsewhere

1. Excavating, Backfilling and Rough Grading: Section 02220
2. Cast-in-Place Concrete: Section 03300

PART 2 - PRODUCTS

2.1 Materials

1. **Pipe and Fittings:** 100 & 150 mm dia. corrugated, plastic drainage tubing to CGSB 41-GP-29M, Type 1 (non-perforated) for discharge lines, Type 2 (perforated) for collector lines.
2. **Filter Cloth:** "Terrafix" 270R or Mirafi 140.
3. **Coarse Filter Aggregate:** 15 mm pea gravel.
4. **Fine Filter Aggregate:** C.S.A. Fine Concrete Aggregate.

PART 3 - EXECUTION

3.1 Installation at Perimeter of Building

1. If drain is not on footing, place a min. 100 mm of coarse filter material.
2. Lay unwrapped perforated pipe directly on coarse filter material. Invert of pipe to be minimum of 250 mm below underside of floor slab. Provide pipes sloping to drains as shown on drawings. Minimum slope 1%.
3. Install minimum 150 mm of coarse filter material to sides and top of perforated pipe for perimeter drainage.
4. Install minimum 300 mm Granular "B" all around coarse filter material (sides and top).
5. Install minimum 150 mm coarse filter material cover on all sides of non-perforated pipe.
6. Ensure pipe interior and coupling surfaces are clean before laying.
7. Do not use concrete, masonry, stones, wood or any type of shim to establish pipe slope.
8. Connect pipes using manufacturer's recommended fittings and seal joints with sewer compound.
9. Protect pipe ends from damage and ingress of foreign material at each end of each day's work or work stoppage.

10. Place filter material after pipe installation has been inspected.

11. Place filter material by hand in 150 mm lifts. Consolidate by tamping lightly. Prevent displacement of pipe.

12. Backfill trench (1 m wide minimum) with Granular "B" lightly compacted to 95% standard density (except under paved areas: 98%) up to 700 mm below finished grade.

3.2 Installation under paved areas

1. Trench for weeping tile will be 300 mm wide and extend to a depth of 350 mm minimum in the subgrade below granular base.

2. Line trench with filter cloth. Filter cloth shall be wide enough to overlap 150 mm minimum after backfilling.

3. Place 40 mm of clear crushed aggregate and compact to 98% standard proctor maximum dry density.

4. Lay 150 mm diameter perforated pipe directly on compacted granular material. Minimum slope 0.5%.

5. Backfill trench up to subgrade elevation with clear crushed aggregate compacted to 98% standard proctor maximum dry density.

6. Fold filter cloth over compacted granular. Overlap 150 mm minimum.

7. Where weeping tile pipe joins into other piping or material at storm drains or catch basins and at all direction changes, use specifically designed fittings and seal joints with sewer compound in accordance with manufacturer's instructions.

End of Section

1. General

1.1 RELATED WORK

1. Section 03200 - Concrete Reinforcement
2. Section 03300 - Cast-in-Place Concrete

1.2 REFERENCES

1. ANSI/ACI-347-78, Concrete Formwork, Recommended Practice for.
2. CAN/CSA-A23.1-M94, Concrete Materials and Methods of Concrete Construction.
3. CAN3-086-M84, Engineering Design in Wood (Working Stress Design).
4. CAN3-086.1-M94, Engineering Design in Wood (Limit States Design).
5. CSA 0121-M1978, Douglas Fir Plywood.
6. CSA 0153-M1980, Poplar Plywood.
7. CAN3-0188.0-M78, Standard Test Methods for Mat-Formed Wood Particle boards and Wafer board.
8. CSA S269.1-1975, (R1998), Falsework for Construction Purposes.
9. CSA 0151-M1978, Canadian Softwood Plywood.

1.3 SHOP DRAWINGS

1. Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
2. Indicate method and schedule of construction, materials, arrangement of joints, ties, shores, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings.
3. Each shop drawing submitted to bear the stamp and signature of qualified professional engineer registered in the Province of Ontario.

2 PRODUCTS

2.1 MATERIALS

1. Formwork Lumber: Plywood and wood formwork materials to CSA-0121, CAN3-086, CAN3-086S1, CAN3-086.1, CAN3-086.1S1, CSA-0153.

2. Falsework Materials: To CSA S269.1.

3. Pan Forms: Removable as indicated.

4. Tubular Column Forms: Round, spirally wound laminated fibre forms, internally treated with release material.

5. Form Ties: Removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25mm dia. in concrete surface.

6. Form Liner:
   a. Plywood: High density overlay, Douglas Fir to CSA 0121, 16mm thick, for exposed concrete.

7. Form Release Agent: Chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms.

8. Form Stripping Agent: Colourless mineral oil, free of kerosene, with viscosity between 70 and 110 s Saybolt Universal, 15 to 24 mm2/s at 40 deg. C, flash point minimum 150 deg. C, open cup.

9. Plastic cones at form ties, 25mm dia., light grey.

3 EXECUTION

3.1 ERECTION

1. Verify lines, levels and column centres before proceeding with formwork and ensure dimensions agree with Drawings.

2. Obtain Consultant's permission for use of earth forms.

3. Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

4. Construct falsework in accordance with CSA S269.1.

5. Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1, ANSI/ACI-347.

6. Obtain Consultant's permission before framing openings not indicated in concrete joists, beams or columns.

7. Align form joints and make watertight. Keep form joints to minimum.

8. Locate horizontal form joints for exposed columns 2.44 meter above finished floor elevation.

9. Use 1" chamfer strips on external corners of beams, joints and columns.

10. Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

11. Exposed faces of exterior wall and underside of ground floor slab.

12. Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

13. Leave formwork in place for following minimum periods of time after placing concrete.
    a. 2 days for walls and sides of beams; exclude retaining wall.
    b. 3 days for columns.
    c. 14 days for beam soffits, slab, decks and other structural members, or 7 days when replaced immediately with adequate shoring to standard specified for falsework.
    d. 2 days for footings.

14. Re-use of formwork and falsework subject to requirements of CAN/CSA-A23.1.

15. Slip forming may be approved by Consultant subject to evaluation of procedures and mechanical equipment proposed for use.

16. For all exposed concrete (refer to Architectural Exterior Elevations), locate form ties and install cones at locations and in pattern indicated on Drawings.

17. See further requirements under Section 03330 - Architectural Concrete.

End of Section

1 GENERAL

1.1 RELATED WORK

1. Section 03100 - Concrete Formwork

2. Section 03300 - Cast-in-Place Concrete

1.2 REFERENCE STANDARDS

1. Do reinforcing work in accordance with CAN3-A23.1-94, ACI-318-92, CAN3-S6-M88, CAN3-S6S1-M1990, CAN3-S6S2-81, CAN3-S6S3-82 and welding of reinforcing with CSA W186-M1998, except where specified elsewhere.

1.3 SOURCE QUALITY CONTROL

1. Provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 5 weeks prior to commencing reinforcing work.

2. Inform Consultant of proposed source of material to be supplied.

1.4 SHOP DRAWINGS

1. Submit shop drawings in accordance with Section 01330 - Submittal procedures.

2. Shop drawings consist of bar bending details, lists and placing drawings.

3. On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and mechanical splices, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacing and location of chairs, spacers and hangers. Do drawings in accordance with Reinforcing Steel Manual of Standard Practice, by Reinforcing Steel Institute of Ontario, and ACI Manual of Standard Practice for Detailing Reinforced Concrete Structures.

4. Design and detail lap lengths and bar development lengths to CAN3-A23.3-94, unless otherwise indicated. Provide Type A, B, C tension lap splices where indicated.

1.5 SUBSTITUTES

1. Substitution of different size bars permitted only upon written permission of consultant.

2 PRODUCTS

2.1 MATERIALS

1. Reinforcing Steel: Billet steel, Grade 400, deformed bars to CSA G30.18-M92 (R1988) unless indicated otherwise.

2. Reinforcing Steel: Weldable low alloy steel deformed bars to CSA G30.16-92.

3. Cold-drawn annealed steel wire ties: To CSA G30.3-M1983 (R1998).

4. Deformed steel wire for concrete reinforcement: To CSA G30.14-M1983 (R1998).

5. Welded steel wire fabric: To CSA G30.5-M1983 (1998). Provide in flat sheets only.

6. Epoxy coating of non-prestressed reinforcement: To ASTM A775/A775M-86.

7. Chairs, bolsters, bar supports, spacers: To CAN3-A23.1-94.

8. Mechanical splices: Subject to approval of Consultant.

9. Plain round bars: To CAN/CSA-G40.21-94.

2.2 FABRICATION

1. Fabricate reinforcing in accordance with CAN3-A23.1-94, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.

2. Obtain Consultant's permission for locations of reinforcement splices other than shown on placing drawings.

3. Upon permission of Consultant, weld reinforcement in accordance with CSA W186-1998.

4. Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

3 EXECUTIOM

3.1 FIELD BENDING

1. Do not field bend reinforcement except where indicated or authorized by Consultant.

2. When field bending is authorized, bend without heat, applying a slow and steady pressure.
3. Replace bars which develop cracks or splits.

3.2 PLACING REINFORCING

1. Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN3-A23.1-94.

2. Use plain round bars as slip dowels in concrete. Paint portion of dowel intended to move within hardened concrete with one coat of lead or asphalt paint. When paint is dry, apply a thick even film of mineral lubricating grease.

3 Prior to placing concrete, obtain Consultant's permission of reinforcing steel and position.

3.3 FIELD TOUCH-UP

1. Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating

End of Section

1 GENERAL

1.1 RELATED WORK

1. Section 07160 – Damp proofing
2. Section 03200 - Concrete Reinforcement
3. Section 03350 - Concrete Finishing

1.2 REFERENCE STANDARDS

1. Do cast-in-place concrete work in accordance with CAN3-A23.1-94 and testing in accordance with CAN3-A23.2-94, except where specified otherwise.

1.3 SAMPLES

1. Submit samples in accordance with Section 01300 - Submittals.
2. Waterstops

1.4 CERTIFICATES

1. Minimum four (4) weeks prior to starting concrete work, submit to Consultant manufacturer’s test data and certification by qualified independent inspection and testing laboratory that the following materials will meet specified requirements:

    a. Portland Cement
    b. Blended hydraulic cement
    c. Supplementary cementing materials
    d. Grout
    e. Admixtures
    f. Aggregates
    g. Water
    h. Waterstops
    i. Waterstop joints
    j. Joint filler.

2. Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN3-A23.1-94, and that mix design is adjusted to prevent alkali aggregate reactivity problems.

1.5 CONSTRUCTION QUALITY CONTROL

1. Submit proposed quality control procedures for Consultant's permission, two (2) weeks before construction.

2 PRODUCTS

2.1 MATERIALS

1. Portland Cement: To CAN3-A5-98.

2. Water: To CAN3-A23.1-94, CAN3-A23.5-94.

3. Aggregates: To CAN3-A23.1-94. Coarse aggregates to be normal density.

4. Low Density Aggregate for Insulating Concrete: To CAN3-A23.1-94.

5. Air Entraining Admixture: To CAN3-A266.1-M78.

6. Chemical Admixtures: To CAN3-A266.2-M78. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

7. Shrinkage Compensating Grout: Premixed compound consisting of metallic, non-metallic aggregate, Portland cement, water reducing and plasticizing agents.
   a. Compressive Strength: 80 MPA at 28 days.
   b. Consistency:
      i) Fluid: To ASTM C827-82. Time of afflux through flow cone (ASTM C939-81), under 30 s.
      ii) Flowable: To ASTM C827-82. Flow table, 5 drops in 3 s, (ASTM C109-86, applicable portion) 125 to 145%.
      iii) Plastic: To ASTM C827-82. Flow table, 5 drops in 3 s, (ASTM C109-86, applicable portions) 100 to 125%.
   c. Net Shrinkage at 28 Days: Maximum 0.1%.
   d. Dry Pack: To manufacturer's requirements.

8. Non-Premixed Dry Pack Grout: Composition of non-metallic aggregate Portland cement with sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compression strength of 8 ksi at 3 days.

9. Curing Compound: To CAN3-A23.1-94 white; and to ASTM C309-81, Type 1 - chlorinated rubber, Type 1-D with fugitive dye.

10. Cushion Pad: Tough, resilient, weather, moisture, and oil resistant material that will not corrode or cause corrosion, consisting of either layers of approved cotton duck saturated and bound together by approved rubber or synthetic compounds, or made from specially compounded synthetic materials.

11. Ribbed Waterstops: Extruded PVC Arctic Grade of sizes indicated with shop welded corner and intersecting pieces with legs not less than 500mm long:
    a. Tensile Strength: To ASTM D412-83, Die "C" method, minimum 11.4 MPA.
    b. Elongation: To ASTM D412-83, Die "C" method, minimum 275%.
    c. Tear Resistance: To ASTM D624-86, Die "B" method, minimum 48 kN/m.

12. Premoulded Joint Fillers:
    a. Bituminous Impregnated Fibre Board: To ASTM D1751-83.
    b. Sponge Rubber: To ASTM D1752-84, Type I, flexible, firm grade.
    c. Self-expanding, Standard Cork: To ASTM D1752-84, Type II.

13. Weep Hole Tubes: Plastic.

14. Dovetail Anchor Slots: Minimum 0.76mm thick galvanized steel with insulation filled slots.

2.2 CONCRETE MIXES

1. Proportion normal and high density concrete in accordance with CAN3-A23.1- 94.
    a. Cement: Use Type 10 Portland cement.
    b. Minimum Compressive Strength at 28 Days: 30 MPA and as indicated on drawings.
    c. Minimum Cement Content: 336 kg/m^3. of concrete.
    d. Class of Exposure: See CAN3-A23.1-94.
    e. Nominal Size of Coarse Aggregate: 16mm.
    f. Slump at Time and Point of Discharge: 65mm to 75mm.
    g. Air Content: +/- 4%.

2. Do not change concrete mix without prior approval of Consultant. Should change in material source be proposed, new mix design to be approved by Consultant.

3 EXECUTION

3.1 WORKMANSHIP

1. Obtain Consultant's permission before placing concrete.

2. Pumping of concrete is permitted only after permission of equipment and mix.

3. Ensure reinforcement and inserts are not disturbed during concrete placement.

4. Prior to placing of concrete, obtain Consultant's permission of proposed method for protection of concrete during placing and curing in adverse weather.

5. Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples.

6. Do not place load upon new concrete until authorized by Consultant.

7. Refer to CSA 23.1-94, item 22.12 for straight edge method.

3.2 INSERTS

1. Set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100mm x 100mm not indicated on Structural Drawings must be approved by Consultant.

2. No sleeves, ducts, pipes or other openings shall pass through joists, beams, column capitals or columns, except where expressly detailed on Structural Drawings or approved by Consultant.

3. Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain permission of modifications from Consultant before placing of concrete.

4. Check locations and sizes of sleeves and openings shown on Structural Drawings with Architectural, Mechanical and Electrical Drawings.

5. Set special inserts for strength testing as indicated and as required by Non-Destructive Method of Testing Concrete.

6. Anchor Bolts:
   a. Place anchor bolts to templates under supervision of trade supplying anchors prior to placing concrete.
   b. With Consultant's permission, grout anchor bolts in preformed holes or holes drilled after concrete has set. Formed holes to be at least 100mm in diameter. Drilled holes to be minimum 25mm larger in diameter than bolts used.
   c. Protect anchor bolt holes from water accumulations.
   d. Set bolts and fill holes with shrinkage compensating grout.
   e. Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to temperature at time of erection

7. Drainage Holes and Weep Holes:
   a. Form weep holes and drainage holes in accordance with Section 03100 - Concrete Formwork and Falsework.
   b. Install weep hole tubes and drains as indicated.

8. Dovetail Anchor Slots:
   a. Install continuous vertical anchor slot to forms where masonry abuts concrete wall or columns.
   b. Install continuous vertical anchor slots at 800mm oc where concrete walls are masonry faced.

3.3 PLACING GROUT

1. Grout under base plates and machinery using procedures in accordance with manufacturer's
recommendations which result in 100% contact over grouted area.

3.4 FINISHING

1. Finish concrete in accordance with CAN3-A23.1-94.

2. Rub exposed sharp edges of concrete with carborundum to produce 3mm radius edges unless otherwise indicated.

3. See further requirements under Section 03330 for Architectural Concrete.

3.5 WATERSTOPS

1. Install waterstops to provide continuous water seal. Do not distort or pierce waterstop in such a way as to hamper performance. Do not displace reinforcement when installing waterstops. Use equipment to manufacturer's requirements to field splice waterstops. Tie waterstops rigidly in place.

2. Use only straight heat sealed butt joints in field. Use factory welded corners and intersections.

3.6 JOINT FILLERS

1. Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

2. Locate and form isolation or expansion joints as indicated. Install joint filler.

3. Use 13mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 13mm of finished slab surface unless indicated otherwise. Other forms of bond breaker may be substituted in lieu of joint filler with permission of Consultant.

3.7 COLD-WEATHER CONCRETING

1. Adequate protection must be provided when low temperatures occur during placing and during the early curing period in accordance with CAN3.A23.1M.

2. Protection must be continued until the concrete has attained the minimum properties required by the environment and the loading to which it will be exposed.

3. Concrete should never be placed on a frozen subgrade. When the subgrade is frozen for a depth of only 50 mm (2") to 75 mm (3"), the surface can be thawed by:
   a. Steaming
   b. Spreading a layer of hot sand, gravel, or other granular material
   c. Burning straw or hay

4. Commercial insulating blankets or bat insulation can be used to retain heat in the

concrete during curing.

5. Heated enclosures are required to use for protecting concrete when air temperatures are near or below freezing. They can be made of wood, canvas, building board, and plastic film.

6. For the fresh concrete within the enclosure, a vented or indirect-fired heater is required.

7. For the fresh concrete above the enclosure, an unvented or direct-fired heater is required.

3.8 FIELD QUALITY CONTROL

1. Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Consultant in accordance with CAN3-A23.1-94.

2. Costs of tests are included in Section 01210 (Cash Allowances). Additional test cylinders will be taken during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

3. Non-destructive Methods for Testing Concrete shall be in accordance with CAN3-A23.2-94.

4. Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

End of Section

PART 1 - GENERAL

1.1 Related Work

1.	Concrete Formwork	Section 03100
2.	Cast-in-Place Concrete	Section 03300
3.	Rough Carpentry	Section 06100
4.	Fire Stopping and Smoke Seals	Section 07270
5.	Floor Porcelain Tile	Section 09320
6.	Painting	Section 09900
7.	Mechanical	Division 15
8.	Electrical	Division 16

1.2 Reference Standards

1. CSA-A23.1-14 Concrete Materials and Methods of Concrete Construction
2. CSA-A23.2-14 Test Methods and Standard Practices for Concrete

1.3 Qualification

1. The work of this Section shall be carried out by an established concrete finishing company having a proven record of satisfactory workmanship for a period of at least 5 years prior to this contract and approved by the Consultant.

1.4 Scope of Work

1. Supply all materials, labour and service to provide acceptable finishes to all concrete floors, exterior slabs and exterior steps where indicated or required.

2. Supply all labour, materials and equipment necessary and as required to provide acceptable finishes for all concrete floor slabs, exterior concrete sidewalks, aprons, steps, traffic deck and exposed concrete retaining walls where noted on drawings and specified herein.

PART 2 - PRODUCTS

2.1 Materials

1. Concrete Mixes: As specified in Section 03300.

2. Curing and Sealing Compounds: As specified in Section 03300.

3. Concrete Hardeners: As specified in Section 03300.

4. Formwork: As specified in Section 03100.

5. Exposed Aggregate: As specified in Section 03300.

6. Admixtures: As specified in Section 03300.

7. Retarders: As specified in Section 03300.

PART 3 - EXECUTION

3.1 Curing and Protection

1. Cure, seal and protect newly finished slabs and steps in accordance with CSA-A23.1, Section 21, and as specified in Section 03300.

3.2 Concrete Finishing

1. General: Finish surfaces of all concrete in a manner acceptable for the installation of finished floor materials or if exposed in a manner acceptable to the Consultant.

2. Broom Finish: Concrete floor surfaces, which are to receive quarry, ceramic tile or precast terrazzo, and exterior sidewalks and concrete paving Type 1 shall have a fine broom finish after trowelling.

3. Steel Trowel Finish: All interior concrete floors, and concrete curbs which are to receive special flooring, resilient flooring or remain exposed, shall have steel trowel finish. After surfaces have been floated, steel trowel with machine trowels to produce a smooth, dense, hard surfaces with close surface tolerances.

4. Learning Steps Area: Provide all new formwork and smooth trowel finish for exposed concrete in this area.

5. Control Joints: Sawcut control joints as shown on drawings. Maximum spacing of control joints 3000mm in each direction. Co-ordinate locations with finished floor control joints. Sawcut joints within 24 hours of placing and to a depth as detailed on drawings.

6. Provide sample for approval by the Consultant. Make every effort to ensure that colour of materials is constant throughout. Bush hammering shall be sufficient to expose the coarse aggregate. Sample shall be applied to actual surface of concrete walls which shall remain as a minimum standard upon acceptance by the Consultant.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Structural Steel: Refer to Structural Drawings

1.2 Reference Standards

1. CAN3-A82.1-M87 Burned Clay Brick (Solid Masonry Units Made From Clay or Shale).
2. CAN3-S304-84 Masonry Design for Buildings.
3. CAN3-A370-M84 Connectors to Masonry.
4. CAN3-A371-M84 Masonry Construction for Buildings.
5. CAN/CGSB-37.2-M88 Emulsified Asphalt, Mineral Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
6. CAN3-A82.2-M78 (R1984) Methods of Sampling and Testing Brick.
7. CAN3-A165 Series-M85 CSA Standards on Concrete Masonry Units.
8. CSA A179-M1976 Mortar and Grout for Unity Masonry.
9. Conform to CAN3-S304 “Masonry Design for Buildings”. Lay masonry to CAN3-A371.

1.3 Job Mock-Up

1. Construct mock-up panel of exterior masonry wall construction, 2000 mm x 2000 mm, showing all masonry materials and colors, fixtures, jointing, coursing, mortar and workmanship.

1.4 Source Quality Control

1. For clay units, in addition to requirements set out in referenced CSA and ASTM Standards include data indicating initial rate of absorption for units proposed for use.

1.5 Product Delivery, Storage and Handling

1. Ensure that materials are delivered to job site in dry condition.
2. Except where wetting of bricks is specified, keep materials dry until use.
3. Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 Cold Weather Requirements

1. Comply with Clause 5.15.2 of CAN3-A371-M84.

1.7 Hot Water Requirements

1. Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

1.8 Protection

1. Until completed and protected by flashings or other permanent construction, keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain.

2. Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

3. Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

PART 2 - PRODUCTS

2.1 Materials

1. **Concrete Masonry Units:**
   - .1 Must be "Bubble Cure" or autoclave process, modular metric size conforming to CSA Standard A165 series.
   - .2 Normal Weight - H/15/A/M, S/15/A/M.
   - .3 Light Weight – Type (L)(2) 20S Standard Hollow. Use light-weight masonry units for all 2-hour fire resistance walls.
   - .4 All exposed corners to have bullnose units. All block to be uniform in color, shade and texture. Blocks having visual defects shall be rejected for exposed areas, but may be used for concealed areas.

2. **Architectural Stone:**
   - .1 Architectural Stone: match to existing veneer stone.
   - .2 Precast concrete, stone sills: as shown on drawings.

3. **Portland Cement:**
   - .1 To CAN3-A5-M83.

4. **Masonry Cement:**
   - .1 To CSA A8-1970.

5. **Hydrated Lime**:
   - .1 To ASTMC207-74.

6. **Aggregate:**
   - .1 To CSA A82.56-M1976.

7. **Water:**
   .1 Ensure that water contains no salts which may cause efflorescence.

8. **Horizontal Masonry Reinforcing**:
   Welded truss type or ladder type, as specified from wire to CSA-G30, 3M, hot dipped galvanized after fabrication to ASTM A153, Class B2, minimum coating 457 G/m2, wire size 4.76 mm diameter. Reinforcing as per the following:
   - Single wythe walls Dur-O-Wal DW 100;
   - Double wythe walls (up to 390 in width) Dur-O-Wal DW 120;
   - Double wythe walls (greater than 390) Dur-O-Wal DW 220;
   - Cavity Walls Blok-Lok- Blok truss II - BL37 to accommodate a 90 mm cavity with 50 mm thick insulation.

   Similar reinforcing by Dur-O-Wal, Blok-Lok, and Hohmann & Barnard Inc. is acceptable.

   -**Horizontal Masonry Reinforcing, Cavity Wall Alternate**:
   Fero Slotted Block ties (type 1) 16 gauge sheet metal, hot dipped galvanized, insulation support, 4.76 mm Ø, V-tie, hot dipped galvanized with welded truss type or ladder type reinforcing for back up block, as specified.

9. **Reinforcing Bars**: billet steel to grade 400, deformed bars to CSA-G30.12.

10. **Thru-wall Flashing and Air/Vapour Barrier Sheet Membrane Treatment**: Self-adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass. Acceptable materials: Vedagard" by Bakor Inc., Mississauga or sheet air/vapour barrier membrane as specified as in Section 7216.

11. **Lateral Support Anchors:**
    .1 **Vertical:**
       .1 At intersecting and abutting load bearing walls, use prefabricated corners and tees to match horizontal reinforcing.
       .2 At intersection of non-load bearing walls with load bearing or non-load bearing walls, use corrugated galvanized ties.
       .3 At wood parapet and similar conditions, use model BL404 with BLT9 ties, all by BlockLok. Ensure ties extend a minimum of 50 mm into the brick or block outer wythe.

    .2 **Horizontal:**
       .1 Masonry walls extending to the underside of building structure: One piece 12 ga. hot dipped galvanized steel lateral clip supports as supplied by NCA/Acrow Richmond, Rexdale, Ontario. For attachment of clip supports, use “Pos-i-Tie” fasteners.

12. **Bolts and Anchors**: To CAN3-A370.

13. **Natural Mortar:**
    .1 Generally: Use materials only as specified in CSA A179. Ensure that weather and aggregate used in mortar, other than in walls buried in earth, will not cause efflorescence.

.2 Bonding Agent: Acrylic latex type by Sternson Limited, W.R. Meadows or Thoro Building Products. Use for all mortar except brick.
.3 Mixes: Mix mortars as specified in CSA A179 using the Proportion Specification. Add bonding agent in accordance with manufacturer's instructions.
.4 Mortar Types:
  .1 For masonry walls in contact with earth and bedding for bearing plates and lintels: Mortar Type "M".
  .2 For load-bearing walls: Mortar Type "S".
  .3 For brick: Mortar Type "N" (1:1:6) premixed "Betomix 1-1-6" Type "S" portland cement hydrated lime as supplied by Daubois Inc., Jiffy Mortar Systems. Mix on site with sand, water, and colour pigment.
  .4 For all other masonry walls, use regular Type "N" mortar.
.5 Grout: To CSA A179 Table 3.

14. **Colour Pigment:** As manufactured by Harcros Pigments. Make allowance for full loading of 2 kgs. per bag of 1-1-6. Colour as standard grey.

15. **Mortar Dropping Control Device**: "Mortar Net" manufactured by Mortar Net USA (Telephone: 1-800-664-6638).

16. **Weepholes**: 90 mm x 90 mm x 10 mm purpose made PVC, designed to drain cavities and with mesh to prevent insects from entering. Colour to be chosen by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 Workmanship

1. Build masonry plumb, level, and true to line, with joints in proper alignment.

2. Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.2 Tolerances

1. Clause 5.3 of CAN3-A371-M84 applies except as follows: Walls to receive thinset ceramic tile: plumb within 1:600.

3.3 Exposed Masonry

1. Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

3.4 Jointing

1. Except where indicated otherwise on drawings or details or as below, make concave joints, allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints. Where joints are concealed in

walls and where walls are to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating, strike flush.

3.5 Weepholes

1. Provide 10 x 90 x 90 mm PVC weepers at regular internals at both top and bottom of walls as indicated on Drawings. Ensure weepers are clear and not blocked by mortar or mortar droppings.

3.6 Joining of Work

1. Where necessary to temporarily stop horizontal runs of masonry, and in building corner, step-back masonry diagonally to lowest course previously laid. Do not "tooth" new masonry. Fill in adjacent course before heights of stepped masonry reach 1200 mm.

3.7 Cutting

1. Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.

2. Make cuts straight, clean, and free from uneven edges. Use masonry saw where necessary.

3.8 Building-In

1. Build in items required to be built into masonry by other trades.

2. Prevent displacement of built-in items during construction. Check for plumbness, alignment, and correctness of position, as work progresses.

3. Brace door jambs to maintain plumbness. Fill door frame with concrete.

3.9 Wetting of Bricks

1. Except during winter, wet clay brick having an initial rate of absorption exceeding 1g/min /100mm^2; wet to uniform degree of saturation, to 24 hours before laying, and do not lay until `surface is dry.`

2. Similarly, wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

3.10 Support of Loads

1. Except where drawing requirements are more stringent, comply with Clause 6.3 of CAN3-S304-M84.

2. Where concrete fill is used in lieu of solid units, use minimum 20 MPa concrete to Section 03300.

3. Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

3.11 Provision for Movement

1. Leave 5 mm space below shelf angles.

2. Leave 6 mm space and do not use wedges between tops of non-load bearing walls and partitions and structural elements.

3.12 Loose Steel Lintels

1. Install loose steel lintels. Centre over opening width.

3.13 Control and Expansion Joints

1. Except as noted following, control joints required at maximum of 6000 mm o.c. in continuous walls having no openings, intersections or column locations. Refer to elevations for locations on exterior walls and advise Consultant of variances prior to executing the work. Control joints are not shown for clarity on the drawings for interior walls. If in doubt, request assistance from the Consultant.

2. At doorway locations, unless indicated otherwise on elevation drawings, use one side of doorway beyond lintel. Use building paper to prevent that end of lintel to bond.

3. Use standard block with concrete filled end core to form key. Line one side of core with building paper before filling core to prevent bonding. Complete vertical separation, full height and thickness of wall are required.

4. Stop masonry reinforcing at each side of the joints. Caulking specified in Section 07900.

5. At expansion joints in brick and block veneer, leave vertical joint free of mortar to allow for horizontal expansion.

3.14 Horizontal Reinforcing

1. Horizontal reinforcing at 400 mm o.c. (every 2nd course),except solid walls greater than, or equal to 340 mm in width. At 340 mm or greater, if applicable, horizontal reinforcing at 200 mm o.c. (every course). Use prefabricated corners and tees at all intersecting loadbearing walls.

2. Alternate: slotted block ties at 800 mm x 400 mm spacing, horizontal reinforcing, as specified.

3.15 Vertical Reinforcing

1. Install vertical reinforcing to size and spacing as shown on Drawings. Fill voids with minimum 20MPa concrete.

3.16 Bonding

1. Walls of two or more widths: bond using metal ties in accordance with subsection 5.6 of CAN3-A371-84.

2. Receive procedure with and obtain approval by Architect.

3. In cavity walls, keep all cavity spaces free of mortar and debris by placing a wood strip on the ties. Retain strip on a wire line and pull up level and clean off droppings prior to placing next course of ties. Install mortar control device at 300 mm o.c. horizontally, in a staggered pattern so as to overlap each other on each side. Install in every 2nd course above foundation and shelf angles.

3.17 Sound and Fire Separation

1. All loadbearing and non-load bearing partitions shall carry to the underside of structure above.

2. All openings in partitions, even above ceilings shall be patched to maintain sound and fire separation.

3. In partitions and walls not required to be fire separations, fill space between partitions and structural elements with rock wool compressible filler to maintain complete sound separation.

4. In all areas of exposed ceilings, especially at sloped precast concrete, ensure gaps no larger than 19 mm and pack gaps with rockwool, to allow for proper applications of backer rods and sealant.

5. In fire separations, spaces to be firestopped in accordance with Section 07270.

6. Use U.L.C. labelled mortar for all patching in fire separations.

3. Cutting protruding flashing: This procedure is to ensure that thru-wall flashing is installed where intended.

3.18 Inspection & Testing

1. Refer to Section 01005.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Installation of anchors in concrete and masonry: Section 03300, 04200
2. Structural steel: Refer to structural drawings
3. Finish painting: Section 09900

1.2 Scope

1. Provide all miscellaneous metal items except those listed above Under Article 1.1.

1.3 Reference Standards

1. ASTM A167-87 — Specification for Stainless and Heat-Resisting Chromium - Nickel Steel Plate, Sheet and Strip.
2. ASTM A325-90 — Specification for High Strength Bolts for Structural Steel Joints.
3. ASTM A143-74(1989) — Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
4. ASTM A307-90 — Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
5. ASTM A563M-90 — Specification for carbon and Alloy Steel Nuts.
6. ASTM A780-90 — Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized coatings.
7. CAN/CSA-S16.1-M89 — Limit States Design of Steel Structures.
8. CSA W59-M1989 — Welded Steel Construction (Metal Arc Welding)
9. CAN/CSA-G40.20-M92 — General Requirements for Rolled or Welded Structural Quality Steel.
10. CAN/CSA-G40.21-M92 — Structural Quality Steels.
11. CAN/CSA-G164-M92 — Hot-Dip Galvanizing of Irregularly Shaped Articles
12. CISC/CPMA 2-75 — Canadian Institute of Steel Construction/Canadian Paint Manufacturers Association-A Quick Drying Primer for Use on Structural Steel.

13. CAN/CGSB-1.40-M89 Primer, Structural Steel, Oil Alkyd Type.

14. CAN/CGSB-1.108-M89 Bituminous Solvent Type Paint.

1.4 Shop Drawings

1. Submit shop drawings in accordance with Section 01340 prepared and stamped by a Professional Engineer licensed to design structures in the Province of Ontario.

2. Clearly indicate materials, core thickness, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and accessories.

PART 2 - PRODUCTS

2.1 Materials

1. Metals

.1 **Steel sections and plates:** to CAN3 G40.21-M81, Grade 50W for tubes and Grade 44W for plates and flat shapes.

.2 **Welding Materials:** to CSA W59-M1989.

.3 **Bolts and anchor bolts:** to ASTM A307, A325, and A563 as applicable.

.4 **Stainless Steel:** Type 302 or 304 alloy conforming to ASTM A167, No. 4 finish.

2. Primers, Coatings and Shop Painting

.1 **Interior Steel in Dry Areas:** Quick drying oil alkyd conforming to CISC/CPMA 2.75.

.2 **Exterior Steel, Interior Steel in Unheated Areas, Steel Embedded in Concrete:** Hot dip galvanized conforming to CSA G164, minimum Z275 coating.

.3 **Galvanizing** of structural steel components and loose lintels: refer to Section 5120.

.4 **Galvanized Coating Touch-Up:** W.R. Meadows “Galvafroid” or Kerry Industries “Z.R.C.” zinc rich coating or similar manufacturer containing minimum 90% zinc by weight.

.5 Apply one shop coat(s) of primer or coating as indicated above and according to manufacturers recommendations. Do not prime aluminum, stainless steel or those components to be galvanized or encased in concrete.

.6 Use primer unadulterated, as provided by manufacturer. Paint on dry surfaces free from rust scale and grease. Do not paint when temperature is lower than 10 deg. Celsius and rising.

.7 Clean surfaces to be field welded; do not paint.

3. Fastenings

.1 Use nuts and bolts conforming to ASTM A307, A325, and A563 as applicable.
  .1 For interior work, use cadmium-plated fastenings where other protection is not specified.
  .2 For exterior work, use Type 300 or 400 stainless steel.

4. Anchors and Shims

.1 For exposed anchorage of aluminum, if applicable, use stainless steel and otherwise to match metal anchored. For non-exposed work, anchors and shims may be galvanized steel.

5. Pipe

.1 To ASTM A53, extra strong steel pipe for bollards.

6. Bituminous Paint

.1 Alkali-resisting to meet specified requirements of CAN/CGSB-1.108, Type 2. Use to insulate contact between dissimilar metals.

2.2 Fabrication

1. Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

2. Weld all connections where possible, and bolt where not possible unless indicated otherwise on drawings.

3. Use self-tapping shake-proof countersunk flat headed screws on items required to be assembled by screws or as indicated.

4. Where possible, work to be fitted and shop assembled, ready for erection.

5. Exposed welds to be continuous for length of each joint. File or grind exposed welds smooth and flush.

6. Weld all stainless steel by the Argon Arc Process. Grind smooth and polish joints, crence-free, and flush without seams.

2.3 List of Miscellaneous Metal Fabrications

1. This Section includes, but is not limited to the following list. Note: **Galvanize all exterior** items and other items noted. Prime paint all interior items.

  .1 Anchors, Bolts, Inserts, Sleeves for work in this Section.
  .2 Supports and Shelf Brackets.
  .3 Stair railings, handrails and guards.

.4 Hangers and Supports (for work in this Section).
.5 Lintels (if not by Structural Steel).

PART 3 - EXECUTION

3.1 General

1. Supply and install all miscellaneous metal work indicated on the Drawings and not indicated in work of other Sections in addition to items listed below.

3.2 Fabrication & Erection

1. Erect metal work square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

2. Insulate metals, where necessary, to prevent corrosion due to contact between dissimilar metals and between metals and masonry or plaster. Use bituminous paint, butyl tape, building paper or other approved means.

3. Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, expansion bolts and shields, toggles.

4. Make field connections with items specified in Articles 2.1.4 and 2.1.5 and 2.1.8 or weld to CSA S16-1969 and CSA S16S1-1975.

5. Hand items to be cast into concrete or built into masonry over to appropriate trades together with setting templates.

6. Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection.

7. Touch-up galvanized surfaces with zinc primer where burned by field welding. Spray or brush apply a minimum of three (3) coats of zinc-rich paint to achieve a dry film thickness of 8 mils. Apply a finish coat of aluminum paint to provide a colour blend with the surround galvanizing.
   Note: Handrails, plumb, level, rigid and secure, as per details shown on Drawings.

3.3 Railings

1. Provide railings and handrails, as shown on Drawings.

2. Galvanize all exterior railings after fabrication.

3. Wall brackets, as shown, at 1200 mm o.c. maximum.

4. Set railing standards in concrete with heated liquid sulphur to fill hole. Remove overflow immediately.

3.4 Galvanized Steel

1. Galvanize steel members, fabrications, and assemblies after fabrication by the hot dip process in accordance with CSA G164, minimum Z275 coating.

2. Galvanize bolts, nuts and washers and iron and steel hardware components in accordance with CSA G164.

3. Safeguard products against steel embrittlement in conformance with ASTM A143.

4. Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

5. The composition of metal in the galvanizing bath shall be not less than 98.0% zinc.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Concrete Formwork: Section 03100
2. Commercial Steel Doors and Frames Section 08100

1.2 Source Quality Control

1. Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

PART 2 - PRODUCTS

2.1 Materials

1. **Wood Materials:** Material, straight, sawn square, true, dressed four (4) sides properly sized, shaped to correct dimensions from nominal sizes indicated or specified.

2. **Lumber: Use only grade marked lumber. Where left exposed, use best brand of lumber available.** lumber and moisture content to conform to official grading rules of NLGA, for particular lumber and grade, and structurally conform to latest requirements of Ontario Building Code. Conform to Grading Standards, CSA Standard 0141. Moist content not greater than 19% at time of installation.

3. **Blocking, Cants, Bucks, Grounds and Nailing Strips:** Douglas fir Graded 122-C, construction or No. 2 Pine, pressure treated in accordance with CSA 080M.

4. **Plywood:** Douglas fir plywood to CSA 0121-M1978, good one side with waterproof adhesive.

5. **Rough Hardware:** Nails, screws, bolts, lag screws, anchors, special fastening devices and supports required for erection of all carpentry components. Use galvanized components where exposed to exterior atmosphere.

PART 3 - EXECUTION

3.1 General

1. Do all wood framing in accordance with the Ontario Building Code and Can3-086M-1983.

2. Machine dressed work shall be slow fed using sharp cutters and finished members shall be free from drag, feathers, slivers or roughness of any kind.

3. Frame materials with tight joints rigidly held in place.

4. Design construction methods for expansion and contraction of the materials.

5. Erect work plumb, level, square and to required lines.

6. Be responsible for methods of construction for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other trades.

3.2 Furring and Blocking

1. Supply and install furring and blocking, required.

2. Align and plumb faces of furring and blocking to tolerance of 1:600.

3.3 Rough Bucks, Nailers

1. Install wood bucks and nailers, as indicated, including wood bucks and linings around frames for doors and windows.

2. Except where indicated, otherwise, use material at least 38 mm thick secured with 9 mm bolts located within 300 mm from ends of members and uniformly spaced at 1200 mm between.

3. Countersink bolts where necessary to provide clearance for other work.

3.4 Roof Fascias, Cants, Nailers, Curbs

1. Install wood cants, fascia backing, nailers, curbs and other wood supports for roofing, sheet metal fork, roof mounted equipment.

2. Secure with galvanized 9 mm bolts, where indicated, galvanized nails elsewhere. Locate fastenings within 300 mm from ends and uniformly spaced between. Space bolts at 1200 mm and nails at 600 mm centres, except where indicated otherwise.

3. Staple vapour retardant sheet strip to underside of nailers before installation. Apply strip continuous with 200 mm overlap at joints, free of wrinkles and tears, with at least 200 mm exposed for overlap on roof deck.

4. Install wood nailers for roof hoppers, dressed, tapered and recessed slightly below top surface of roof insulation.

3.5 Supports for Mechanical Units

1. Install wood blocking for prefabricated curbs for mechanical units to allow for a level installation on sloping roof.

3.6 Pressure Treated Wood

1. Use wood pressure treated in accordance with CSA 080M for all wood members in contact with exterior walls and roofs.

2. Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.7 Installation of Hollow Metal Frames

1. Set frames plumb and square in their exact location and at correct elevation. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head of frame. Install temporary wood spreaders at mid-height.

2. Where pressed steel frames are installed in concrete walls, secure frames to concrete using lead expansion shields and anchor bolts through pipe sleeves. Perform drilling of concrete as required. Fill recessed bolt heads flush to frame face with approved metal filler and sand smooth.

3. Install fire rated door frames in accordance with requirements of National Fire Code Volume 4, produced by The National Fire Protection Association (NFPA 80).

3.8 General

1. Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Masonry: Section 04200
2. Excavation, Trenching and Backfilling Section 02200
3. Weeping Tile Drainage: Section 02411

1.2 Scope

1. Apply waterproofing on exterior face of all walls where adjacent interior floor elevation is lower than the exterior grade elevation.

1.3 Qualifications and Quality Assurance

1. Waterproofing shall be carried out by applicators skilled and with previous similar experience in this work in strict accordance with manufacturer's printed instructions. Submit proof of experience upon Consultant’s request.

2. Manufacturer’s representative shall be called by the applicator to inspect the substrate prior to commencement of work.

3. Manufacturer’s representative shall be retained by installer to provide technical assistance on an as-needed basis during course of installation of membrane.

1.4 Environmental Conditions

1. Do not proceed with waterproofing application during rainy or inclement weather.

1.5 Submittals

1. Submit samples and manufacturer's literature before ordering materials and proceeding with the work.

1.6 Delivery, Storage & Handling

1. Deliver and store materials in original containers with manufacturer's labels and seals intact.

2. Store solvent base liquids away from excessive heat and open flame.

3. Store emulsion liquids at above freezing temperatures, free from contact with cold or frozen surfaces.

1.7 Protection

1. Take extra care to provide ample protection of materials and work of this section from damage by weather, backfiring operations and other causes.

2. Apply protection board as soon as possible after installation of membrane.

PART 2 - PRODUCTS

2.1 Materials

1. Materials shall be the following types supplied by Grace Construction Products:

   .1 Bituthene 5000 Membrane.
   Acceptable alternate: MEL-ROL/LM, by W.R. Meadows used in conjunction with a rolled matrix drainage system.

PART 3 - EXECUTION

3.1 Conditions of Surfaces

1. Before commencing work, ensure environmental and site conditions are suitable for installation of waterproofing membrane.

2. The substrate shall be clean and dry, free from surface water, ice snow or frost, dust, dirt, oil, grease, curing compounds or any other foreign matter detrimental to the adhesion of the waterproofing membrane.

3. Notify Consultant and Contractor in writing of unsuitable surfaces and working conditions. Commencement of work shall imply acceptance of surfaces and working conditions.

3.2 Mock-Up

1. Construct a 3 m x 2 m mock-up area for inspection by the Consultant prior to proceeding with the work. Mock-up may be part of finished work.

2. Notify Consultant and allow 24 hours for inspection by Consultant.

3.3 Membrane Application

1. **Application:** Apply Bituthene 5000 as per manufacturer's specifications.

2. Peel back bottom flap of filter fabric and place core behind discharge pipe. Wrap loose filter fabric over and around discharge pipe. Tuck excess filter fabric behind pipe. Fold excess filter fabric at top termination down between drainage composite and membrane. Wrap outside corners with filter fabric from horizontal drainage composite and adhere overlapping fabrics.

3. For detailed information on the installation of the Bituthene waterproofing system, refer to the Application Procedures Section of the Grace Waterproofing Products Manual or W.R. Meadows Products Manual.

3.4 Clean-Up

1. Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

End of Section

PART 1 - GENERAL

1.1 Section includes:

1. Not applicable.

1.2 Related Work Specified Elsewhere

1. Masonry: Section 04200

PART 2 - PRODUCTS

2.1 Insulation

1. **Perimeter Foundation Insulation:** Extruded expanded polystyrene to CAN/ULC S701-01, Type 4, butt or shiplapped edges. For use at perimeter of building and at perimeter of foundation areas above and below grade as well as at miscellaneous detail locations calling for rigid insulation.
   .1 Thickness 50 mm (2") (RSI 1.76/R 10.0) - where so indicated.
   .2 Acceptable Material: "Styrofoam SM" as manufactured by Dow Chemical Canada Inc.
   .3 Acceptable Material: "Celfort 300" as manufactured by Celfortec Inc.

2.2 Adhesive

1. Type A: to CGSB 71-GP-24M plus Amdt-Nov.-83, compatible with respective rigid insulation, air/vapour and waterproofing membranes and recommended by manufacturers of those products. Use Bakor 230-21 rigid insulation adhesive for rigid insulation in contact with Blueskin air vapour barrier.

2.3 Air Vapour Barrier Sheet Membrane

1. Self adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass:
   .1 Thickness: minimum 1.45 mm
   .2 Water Vapour Permeance: 0.05 perms max value (2.8 ng/Pam^2.s)
   .3 Air Permeance: less than 0.01 1/m^2 at 75 Pa pressure differential
   .4 Adhesion: 7 day min. Peel adhesion at 5 deg. C:
      .1 to primed concrete: >20 N/cm
      2 to selfedge: >20 N/cm.
      .3 to primed plywood: >25 N/cm
      .4 to metal: >30 N/cm
   .5 Submit manufacturer's Material Data Safety Sheets in accordance with and Sections 01340 and 01570.
   .6 Acceptable Material: "Mel-Rol (LM)" by W.R. Meadows or "Bituthane 5000" by Grace.

2. Perimeter Drainage Board: Acceptable Material: Mel-Drain Composite Soilsheetdrain system.

3. Use where rigid insulation is used in cavity walls.

4. Supply for installation by Section 06100 at wall/roof connection, as per detail.

PART 3 - EXECUTION

3.1 Workmanship

1. Install insulation after building substrata materials are dry, thoroughly clean and capable of providing a firm, uniform bonding surface.

2. Install insulation to maintain continuity of thermal protection to building elements and spaces.

3. Fit insulation closely around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

4. Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use longest possible lengths to reduce number of joints.

5. In multiple layer applications offset both vertical and horizontal joints.

6. Do not enclose insulation until it has been inspected.

3.2 Rigid Insulation

1. **Cavity Walls Below Grade**
   Apply adhesive to insulation board by bead method with 4 mm diameter beads at 350 mm o.c.

2. **Perimeter Foundation Insulation** Apply adhesive to insulation board by spot method with daubs 40 mm diameter x 25 mm high at 200 mm o.c. each way.

End of Section

PART 1 - GENERAL

1.1 Related Work Specified Elsewhere

1. Rigid Insulation: Section 07212
2. Metal Stud System: Section 09111

1.2 Samples

1. Submit duplicate 300 x 300 mm size representative samples of insulation materials in accordance with Section 01340.

PART 2 - PRODUCTS

2.1 Insulation

1. Mineral Fibre: to CSA A101-M83, Roxul AFB Stud Insulation - thickness 89 mm.

2.2 Vapour Barrier Film

1. Polyethylene film to CAN2-51.33-M77, 6 mil thick. Tape for sealing as recommended by manufacturer.

2.3 Accessories

1. Sealant: to CGSB 19-GP-21M.
2. Adhesive: compatible with Vapour Barrier Film.

PART 3 - EXECUTION

3.1 Insulation Installation

1. Install insulation to maintain continuity of thermal protection to building elements and spaces.
2. Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
3. Do not compress insulation to fit into spaces.

3.2 Vapour Barrier Installation

1. Place polyethylene on warm side of insulation and tight to insulation.
2. Glue vapour barrier to framing members. Lap joints 150 mm minimum and tape seal. Ensure joints occur over framing members.

3. Tape seal areas where nails or staples penetrate vapour barrier.

4. Extend vapour barrier tight to perimeter of windows, door frames and other items interrupting continuity of membrane. Tape seal and seal with sealant.

5. Seal vapour barrier at points of penetration.

6. Vapour barrier to be continuous and pass in front of shear walls and precast concrete slabs.

End of Section

PART 1 - GENERAL

1.1 Description of Work

1. The work of this section shall include, but is not limited to: Interior fireproofing, concealed from view and direct contact

1.2 Related Work

1. Fire Stopping and Smoke Seals	Division 07270
2. Mineral Fibre Insulation	Division 07213
3. Structural Steel Framing	Refer to Structural Drawings
4. Steel Joist Framing	Refer to Structural Drawings
5. Mechanical Division 15	Re: Patching
6. Electrical Division 16	Re: Patching

1.3 Quality Assurance

1. Installer: Contractor shall be approved by manufacturer, and be experienced in installing specified products, and is approved by the manufacturer of the fireproofing products. A manufacturer's willingness to sell products to an installer engaged by contractor, does not in itself confer qualification on the buyer.

2. Single Source: Obtain spray applied fireproofing products from a single source for each product required. Provide secondary materials, which are acceptable to the fireproofing manufacturer which, are included in the tested and/or listed designs.

3. Fire Resistance: Provide fireproofing materials that have been listed and classified by one or more of the following testing authorities: Underwriters Laboratories of Northbrook, IL and/or Underwriters Laboratories of Scarborough, Ontario; Warnock Hersey or other testing and inspecting agency acceptable to the architect and authorities having jurisdiction.

4. Packaging: All products must be packaged with proper identifications and approval indications acceptable to the testing and/or listing agency.

5. Asbestos: Manufacturer shall provide Certification that products supplied are 100% asbestos free.

6. Steel Surfaces: **New Structural steel and steel decking shall be unprimed**.

7. Painted Steel Surfaces: Steel surfaces requiring fireproofing that are painted and/or primed, shall meet UL requirements for application and adhesion characteristics. Provide certifications from fireproofing manufacturer of compatibility of fireproofing and painted systems. Restrictions published by UL shall apply.

8. Remedial Work: Steel surfaces with incompatible primers or paint shall be either removed, lathed, or otherwise remedied within the requirements of UL, so that adequate and approved bonding can occur, acceptable to authorities having jurisdiction.

1.4 Project Conditions

1. Environmental Limitations: Do not apply sprayed fireproofing material when ambient or substrate temperatures are 40 deg. F. (4 deg C) or lower, unless temporary heat and protection is provided to maintain temperatures at or above this level for 24 hours before, during and 24 hours after application of fireproofing.

2. Ventilation: Ventilate building spaces during and after application of fireproofing at a rate of four (4) air changes per hour until fireproofing is dry. If natural ventilation is insufficient, employ mechanical means as necessary.

3. Surfaces to be sprayed: Surfaces to be sprayed must be free of any substance that would impair proper adhesion.

4. The contractor shall make available to the fireproofing contractor suitable area(s) for permanent locations for mixing and pumping fireproofing. This site must be:

   .1 Convenient to the structure
   .2 Be able to accommodate delivery of product
   .3 Allow for space for truck storage and trailer parking, and for materials and Equipment
   .4 Be well drained
   .5 Be near a suitable source of potable water of quantity required
   .6 Have a proper source of electrical power, if required.
   .7 Provide temporary heat and ventilation to comply with manufacturers recommendations

1.5 Sequencing

1. Sequence and coordinate application of sprayed fireproofing with other related work specified in other Sections to comply with the following requirements:

2. Provide temporary enclosure for interior applications to prevent deterioration of applied materials exposed to unfavorable environmental conditions.

3. Avoid exposure of fireproofing to unnecessary damage or abrasion.

4. Do not apply fireproofing until all hangers, clips and other necessary supports are in place, requiring penetration of fireproofing if installed after the application of fireproofing.

5. Ducts, piping and other items that would interfere with the application of fireproofing shall not be installed, until application is completed.

1.6 Application Parameters

1. The fireproofing contractor shall be allowed to move freely to apply products as necessary. Materials stored on the floor, shall be protected by the contractor, or relocated if these materials prevent the proper application of fireproofing.

2. Patching, repairing and cleaning of fireproofing, due to damage done by others, shall be performed by the fireproofing applicator.

3. After completion of fireproofing, the fireproofing applicator shall remove all equipment, and broom sweep all floor areas of overspray materials.

4. Application of fireproofing shall not commence until the project is at a stage to allow the applicator to apply product continuously and efficiently, without undue interference and delay by other trades.

5. Conference: Convene a pre-installation conference to establish a procedure to maintain optimum working conditions and to coordinate this work with related an/or adjacent work.

1.7 Submittals, References and Applicable Standards

1. Product Data: Submit manufacturer's product data, installation instructions, use and limitations for each material used, and applicable fire test designs, as listed by approved fire testing organization.

2. Performance Certification: Submit manufacturer's verification of performance criteria, fire performance and compliance with applicable standards.

3. Applicable Standards and Test Methods:

   Products Submitted shall be tested in accordance with the following ASTM test methods:

   .1 E 119 Fire Test of Building Construction and Materials
   .2 E 84 Test for Surface Burning Characteristics of Building Materials
   .3 E 136 Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
   .4 E 605 Thickness and Density of Sprayed Fire Resistive Materials Applied to Structural Members
   .5 E 736 Cohesion/Adhesion of Sprayed Fire Resistive Materials Applied to Structural Members
   .6 E 759 Effect of Deflection of Sprayed Fire Resistive Materials Applied to Structural Members
   .7 E 760 Effect of Impact on Bonding of Sprayed Fire Resistive Materials Applied to Structural Members
   .8 E 761 Compressive Strength of Sprayed Fire Resistive Materials Applied to Structural Members
   .9 E 859 Air Erosion of Sprayed Fire Resistive Materials Applied to Structural Members
   .10 E 937 Corrosion of Steel By Sprayed Fire Resistive Materials Applied to Structural Members
   .11 AWCI "Inspection Procedure for Field Applied Sprayed Fire Protection Materials", and the current UBC Standard on: "Thickness and Density Determination for Spray Applied Fire Protection"
   .12 G 21 Determining Resistance of Synthetic Polymeric Materials to Fungi

1.8 Warranty

1. General Warranty: Submit a written warranty, executed by the contractor and cosigned by the installer, agreeing to repair or replace sprayed fireproofing materials that fall within the specified warranty period.

    .1 Failures include, but are not limited to cracking, flaking, eroding in excess of specified requirements, peeling and delaminating of sprayed fireproofing from substrates due to defective materials or installation. Not covered in this warranty are failures due to damage by others.

2. Warranty Period: 2 years, from date of substantial completion.

PART 2 - PRODUCTS

2.1 Manufacturers

1. Manufacutrers of fire resistive materials having product considered acceptable for use:

    .1 AD Fire Protection Systems
    .2 Cafco Industries Inc.
    .3 Grace Canada Inc.

2.2 MATERIALS

1. **Concealed Cementitious Fireproofing:** meeting the below listed minimum physical properties, for use in locations not subject to physical contact or abuse; eg. Southwest Vermiculite Co. Inc. and licensed manufacturers of Type 5 GP (AD Fire Protection Systems).

    .1 Physical Properties: Minimum values unless otherwise indicated, or higher values required to attain designated fire resistance ratings, measured per standard ASTM test methods referenced above in section 1.08, Part C.

        .1 E 84: Flame Spread 0, and Smoke Developed 0.
        .2 E 136: Passes, and is determined non-combustible
        .3 E 605: Density shall be a minimum of 15 pcf.
        .4 E 736: Cohesion/Adhesion shall be 200 psf , with 150 psf minimum acceptable level; if primed steel is used, comply with requirements published by U.L.I.
        .5 E 759: No cracking, spalling or delamination
        .6 E 760: Impact: No delamination, cracking or spalling
        .7 E 761: Compression shall be 5.0 lb/sq. in.
        .8 E 859: Erosion shall be 0.00 gr/sq.ft. maximum
        .9 E 937: Corrosion: No evidence of corrosion allowed
        .10 G 21: Mold Resistance: No evidence of growth

    .2 Structural members not meeting minimum size requirements specified in a design shall receive a thickness of fireproofing consistent with the member's W/D ratio.

2. **Exposed Fireproofing:** For exposed applications of sprayed fire-resistive materials, provide manufacturers standard products complying with requirements for materials and composition having the following minimum physical properties measured per ASTM standard test methods referenced above; eg. Southwest Vermiculite Co. Inc. and licensed manufacturers of Type 5 GP (AD Fire Protection Systems).

    .1 Physical Properties:

        .1 E 84: Flame Spread 0, and Smoke Developed 0
        .2 E 136: Passes, an is determined non - combustible
        .3 E 605: Density shall be a minimum of 22 pcf.
        .4 E 736: Cohesion/Adhesion shall be 500 psf for products with a minimum density of 22 pcf, and 1000 psf for products with density above 35 pcf.
        .5 E 759: No cracking or delamination
        .6 E 760: Impact: No delamination, cracking or spalling
        .7 E 761: Compression shall be 100 psi for products with a minimum density of 22 pcf, and 300 psi for products with densities over 35 pcf.
        .8 E 859: Erosion shall be 0.00 gr/sq.ft.
        .9 E 937: Corrosion: No evidence of corrosion allowed
        .10 G 21: Mold Resistance: No evidence of mold growth

3. **Refractory Mineral Wool Fire Protection:** Rigid boards of 9 pcf nominal density; produced from asbestos free materials by combining refractory mineral wool manufactured from slag with thermosetting resin binders to comply with ASTM C612 for Class 4 and as follows:

    .1 Thermal Conductivity (R Value): 4.35 at 75 degrees F (23.9 degrees Celsius).
    .2 Surface Burning Characteristics: Flame Spread and Smoke Developed ratings of 15 and 5, respectively.
    .3 Manufacturer and Product Name: eg. Cafco-board Mineral Wool Board Fire Protection by Cafco Industries Inc.

4. **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.

5. **Miscellaneous Materials**: Provide the following materials as standard with each of the fireproofing systems, as recommended by the manufacturer for each condition and substrate.

    .1 Primers: It is not recommended that any structural steel primers are used on any steel surfaces, unless tested and listed by ULI in designs proposed to be used. Compatible primers may be used, providing the fireproofing manufacturer can verify such compatibility in accordance with UL requirements.
    .2 Adhesives: Provide adhesives as necessary, to comply with manufacturer requirements for adhesion of fireproofing. Acceptable adhesives are:
        .1 TC 55 water based acrylic adhesive

.2 Type DK Spatter Coat

.3 Reinforcements: Provide fiberglass mesh or wire lath for areas where adhesion is not compatible and for application of fireproofing to steel joists.

.4 Mold Inhibitor: Provide factory added mold inhibitor tested in accordance with ASTM G 21 for areas such as hospitals, testing laboratories, health facilities and other areas of hygienic requirements.

.5 Top Coats: Use as required and recommended by fireproofing manufacturer or compatible products.

PART 3 – EXECUTION

3.1 Pre-Installation Examination:

The applicator and the contractor shall examine surfaces to be fire protected, and determined if the surfaces are satisfactory. Substrate conditions must comply with the following:

1. Substrates must be free of grease, oil, rolling compounds, incompatible primers, loose mill scale, dirt or any other foreign matter which would prevent proper bonding of fireproofing. Structural steel shall be unprimed. Steel roof and floor decking shall be galvanized only.

2. Any objects such as hangers, piping attachments, and other suspended retainer devices shall be properly secured.

3. Ducts, piping, and other equipment shall not be placed or suspended until the Fireprotection materials are in place.

3.2 Preparation:

1. Clean any substrate not ready to receive fireproofing. Consult with manufacturer if conditions exist not easily remedied.

2. Apply adhesives as necessary.

3. Cover all work subject to oversprays during application. Provide temporary enclosure when necessary to temporarily confine fireproofing and protect the environment.

4. Assure maintenance of ambient temperatures, and/or heat and ventilation when required.

3.3 Installation, General

1. Comply with manufacturers written application instructions and procedures for mixing, conveying and applying products, in accordance with the types of recommended equipment, admixtures and specific procedures regarding special conditions.

2. Coat substrates with adhesives if necessary.

3. Extend fireproofing materials in full thickness per approved design, to be protected. Unless otherwise recommended, install fireproofing complete in each area, prior to another.

4. Provide a uniform surface matching UL requirements for designs approved. Apply products at the minimum densities required, or greater.

5. Cure fireproofing to prevent premature drying; protect from freezing as listed in Section 1.05 of this specification.

6. Exposed to View Applications: Where exposed to view, provide appearance of Fireprotection as follows:

    .1 Provide a troweled surface of appearance previously determined prior to installation
    .2 Surfaces shall be within tolerances of 1/16 inch
    .3 Mask edges of termination's so as to achieve neat and sharp edges.

3.4 Field Quality Control:

1. Testing Agency: The owner shall engage and the contractor and applicator shall approve a qualified independent testing agency to perform field quality inspections of applied fireproofing, and prepare reports.

    .1 Testing shall be done in accordance with the AWCI "Technical Manual 12 - A, Standard Practice for the Testing and Inspecting of Field Applied Sprayed Fire - Resistive Materials" and ASTM E 605.
    .2 Tests shall be done on thickness, density and adhesion
    .3 Variances shall be corrected with the testing agency present, and when the applicator is performing work in the same area, to allow for expedient corrections.
    .4 A schedule of tests to be performed shall be agreed upon by applicator, contractor and testing agency.

3.5 Cleaning and Repair:

1. After completion of each day's work, the applicator shall broom clean the area fireproofed. Areas not to receive fireproofing but are finished surfaces shall be masked.

2. All patching of damaged fireproofing shall be completed by applicator.

3.6 Protection:

1. Provide final protection and maintain conditions in a manner acceptable to Consultant and authorities having jurisdiction.

2. Ensure fire protection is not damaged at time of Substantial Performance of the Work.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Cast-in-Place Concrete: Section 03300
2. Masonry: Section 04200
3. Rough Carpentry (Architectural) Plywood: Section 06100
4. Gypsum Board: Section 09250

Note: Firestopping and Smoke Seals within mechanical and electrical assemblies are specified on related specifications on drawings. All other firestopping and smoke seals are the responsibility of this Section.

1.2 Reference

1. ASTM E814 - Test Method of fire tests of through-penetration firestops, Factory Mutual.
2. CAN4-S101M - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
3. CAN4-S115M - Standard Method of Fire Tests of Firestop Systems.
4. ULC - List of Equipment and Materials.

1.3 System Description

1. Firestopping Materials: CAN4-S115M ASTM E814 to achieve a fire protection rating as noted on Drawings.
2. It is the intent of this Section that in conjunction with Mechanical and Electrical scopes a competent, single source be responsible for the firestopping and smoke seals of the entire project.

1.4 Submittals

1. Submit a product data to requirements of Section 01340.
2. Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation, ULC design references.
3. Submit proposed type of fireproofing system for each location for approval by Architect. Fireproofing System must be appropriate to achieve expected appearance and finish.

1.5 Quality Assurance

1. Manufacturer: Company specializing in manufacturing products of this Section with minimum five years documented experience.

2. Applicator: Approved, licensed and supervised by the manufacturer of firestopping materials. Company with minimum five years documented experience.

3. Product: Manufactured under ULC Follow-up Program. Each container or package shall bear ULC label.

1.6 Regulatory Requirements

1. Conform to applicable code for fire protection ratings.

2. Provide certificate of compliance for authority having jurisdiction indicating approval.

1.7 Delivery, Storage & Handling

1. Deliver and store materials in a dry, protected area, off ground in original, undamaged, sealed containers with manufacturer's labels and seas intact.

1.8 Project & Site Conditions

1. Application temperature and ventilation as per Manufacturer's instructions.

1.9 Sequencing & Scheduling

1. Sequence work to permit installation of firestopping and smoke seal materials to be installed after adjacent work is complete and before closure of spaces.

PART 2 - PRODUCTS

2.1 Materials

1. A/D Firebarrier Firestop Systems, by A/D Fire Protection Systems Inc., capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115 and not to exceed opening sizes for which they are intended.

2. Mineral Wool Backing Insulation: ULC labelled, preformed non-combustible material (A/D Firebarrier Mineral Wool) by A/D Fire Protection Systems Inc.

3. Retainers: Clips to support mineral wool.

4. Firestopping Sealant: ULC labelled, single component silicone bases, A/D Silicone Firebarrier Sealant by A/D Fire Protection Systems Inc.

5. Firestopping Seal: ULC labelled, single component water-base seal, A/D Firebarrier Seal by A/D Fire Protection Systems Inc.

6. Firestopping Foam: ULC labelled, two components silicone foam, A/D Firebarrier RTV Foam by A/D Fire Protection Systems Inc.

7. Firestopping Mortar: ULC labelled, non-combustible fibre reinforced, foamed cement mortar, A/D Firebarrier Mortar by A/D Fire Protection Systems Inc.

8. Damming Material: In accordance with tested assembly being installed as applicable and as acceptable to authorities having jurisdiction.

PART 3 - EXECUTION

3.1 Examination

1. Examine surfaces to receive work of this Section and report any defects which may affect the Work of this Section.

2. Verify that openings are ready to receive the Work of this Section.

3. Confirm compatibility of surfaces to receive firestopping and smoke seal materials.

4. Beginning of installation means acceptance of existing surfaces and substrate.

3.2 Preparation

1. Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

2. Prepare surfaces in contact with firestopping materials and smoke seals to manufacturer's instruction.

3.3 Application

1. Install firestopping and smoke seal material and components in accordance with ULC listing and manufacturer's instructions.

2. Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

3. Apply in sufficient thickness to achieve rating to uniform density and texture.

4. Provide temporary forming if required.

5. Tool or trowel exposed surfaces to a neat finish where required.

6. Remove excess material promptly as work progresses and upon completion.

7. Protect installed material until cured or set.

3.4 Cleaning

1. Clean adjacent surfaces of firestopping and smoke seal materials.

3.5 Field Quality Control

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

3.6 Scheduling

1. Firestop and smoke seal at:

    .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

    .2 Top of fire-resistance rated masonry and gypsum board partitions.

    .3 Intersection of fire-resistance rated masonry and gypsum board partitions.

    .4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

    .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs, if applicable.

    .6 Openings and sleeves installed for future use through fire separations.

End of Section

PART 1 - GENERAL

1.1 Related Work Specified Elsewhere

1. Caulking between members of hollow metal frames and screens: Section 08100

2. Caulking of all masonry joints: Section 04200

1.2 Environmental Conditions

1. Sealant and substrata materials to be minimum 5 deg. C.

2. Should it become necessary to apply sealants below 5 deg. C, consult sealant manufacturer and follow their recommendations.

1.3 Warranty

1. Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces, in accordance with Section 1740 for two (2) years total.

PART 2 - PRODUCTS

2.1 Materials

1. Primers: type recommended by sealant manufacturer.

2. Joint Fillers:
   - .1 General: compatible with primers and sealants, outsized 30 to 50%.
   - .2 Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.
   - .3 Neoprene or butyl rubber: round solid rod, Shore A hardness 70.
   - .4 Polyvinyl chloride or neoprene: extruded tubing with 6 mm minimum thick walls.
   - .5 Bond breaker: pressure sensitive plastic tape which will not bond to sealants.
   - .6 Sealant Type A: One component, chemical curing, conforming to CAN2-19.13-M82, Class C-2-25-B-N; multi-component, chemical curing, conforming to CAN2-19.24-M80, Type 2, Class B.
   - .7 Sealant Type B: Multi-component, chemical curing mildew resistant conforming to CGSB 19-GP-22M.
   - .8 Sealant Type C: Multi-component, acrylic emulsion base, conforming to CGSB 19-GP-17M.
   - .9 Sealant Type D: One component, polyurethane base, chemical curing, conforming to CAN2-19.13-M82, Class C-1-25-B-N; or multi-component, chemical curing, conforming to CAN2-19.24-M80, type 1.
3. Color of Sealants: to be selected by Consultant. Allow for a total of two (2) colours for Type A, two colours for Type B, two colours for Type C and one colour for Type D. Locations as directed on site by Consultant.

4. Joint cleaner: xylol, methylethyl-ketone or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

5. Vent tubing: 6 mm inside diameter extruded polyvinyl chloride tubing.

PART 3 - EXECUTION

3.1 New Work

1. Caulk where specified in Item 3.4 and everywhere required.

2. Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.

3. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

4. Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.

5. Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.

6. Examine joint sizes and correct to achieve depth ratio 1/2 of joint width with minimum width and depth of 6 mm, maximum width 25 mm.

7. Install joint filler to achieve correct joint depth.

8. Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

9. Apply bond breaker tape where required to manufacturer's instructions.

10. Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.

3.2 Application

1. Apply sealants, primers, joint fillers, bond breakers, to manufacturer's instructions. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.

2. Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.

3. Apply sealant to joints between window or door frames to adjacent building components around perimeter of every external window or door opening, to control joints in masonry walls and where indicated. In masonry cavity construction, vent caulked joints from cavity to 3 mm beyond external face of wall by inserting vent tubing at bottom of each joint and maximum to 1500 mm o.c. vertically. Position tube to drain to exterior.

4. Apply sealant to close gaps at all junctures of all interior walls meeting exposed ceilings. Provide required foam backer rods to ensure integrity of sealant bead when applied to juncture. Tool finish smooth to receive paint finish.

5. Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints.

6. Use sealants specified in the following locations:

   Type A:
   Joints between windows or door frames and adjacent building components; control and expansion joints and all other locations where sealing is required, except in locations designated for Type B, C and D. Ensure that sealant chosen (from the several specified under "MATERIALS") for each location is recommended by manufacturer for use on surfaces encountered.

   Type B:
   Joints between splash backs and walls.

   Type C:
   Joints between interior metal door frames and partitions.

   Type D:
   Joints in horizontal surfaces between concrete slabs.

3.3 Work Included

1. Work shall incude but not limited to the following areas:
   .1 exterior and interior hollow metal frames and screens; both sides;
   .2 exposed control and expansion joints in masonry walls, masonry corners, joints in front of steel lintels bearing on exterior brick jambs;
   .3 joints at all washroom vanities, hair dryers, hand dryers, electrical panels, access doors, tub/showers and adjacent surfaces. (Use sanitary caulking.)
   .4 joints between masonry and concrete surfaces.
   .5 joints between gypsum board and masonry, or other dissimilar materials.
   .6 joints between louvres and other surfaces.
   .7 exterior siding, prefinished metal fascia, flashing and trim.
   .8 penetrations through roofs, floors and walls other than firestopping
   .9 at all other locations on drawings, except as noted below.

2. Sealing of joints to the underside of exposed precast slab to be by precast installer.

3. Sealing of all joints at top of walls meeting exposed flat or sloped precast ceilings to be included in this section.

4. Sealing of all interior and exterior joints between between existing buildings and new construction is the responsibility of this Section.

End of Section

PART 1 - GENERAL

1.1 Work Included

1. A single manufacturer shall fabricate products included within the scope of this Section.

2. Manufacturer shall be a member in good standing of the Canadian Steel Door Manufacturers Association (CSDMA).

3. Supply only of steel frame products including frames, transom frames, sidelight and window assemblies with provision for glazed, paneled or louvered openings, fire labeled and non-labeled, as scheduled or detailed by the Architect.

4. Supply only of flush steel doors with provision for glazed, paneled or louvered openings, insulated and un-insulated, fire labeled, with or without temperature rise ratings and non-labeled, as scheduled or detailed by the Architect.

5. Supply only of steel panels, similar in construction to steel doors, with flush or abetted bottoms for steel frames, transom frames, sidelight and window assemblies, fire labeled and non-labeled, as scheduled or detailed by the Architect.

6. Doors and frames shall be prepared for, but not limited to, preparation for continuous hinges, heavy weight hinges, cylindrical locks, rim and concealed vertical rod/ mortise lock case exit devices, surface door closers and concealed overhead stops.

1.2 Related Work

1. Building-in of frame product into unit masonry, previously placed concrete, structural or steel or wood stud walls.

2. Supply and installation of wood, plastic or composite core doors.

3. Supply and installation of builders' hardware except as specified for acoustic assemblies.

4. Drilling and tapping for surface mounted or non-templated builders' hardware.

5. Caulking of joints between frame product and other building components.

6. Supply and installation of gaskets or weather-strip.

7. Supply and installation of louvers or vents.

8. Supply and installation of glazing materials.

9. Site touch-up and painting.

10. Wiring for electronic or electric hardware.

11. Field measurements.

12. Fasteners for frame product in previously placed concrete, masonry or structural steel.

13. Steel lintels, posts, columns or other load-bearing elements.

14. Field welding.

1.3 Requirements of regulatory agencies

1. Install fire labeled steel door and frame product in accordance with NFPA-80, current edition, unless specified otherwise.

1.4 References

1.	ANSI A115.IG-1994	Installation Guide for Doors and Hardware
2.	ANSI A250.4-1994	Test Procedure and Acceptance Criteria for Physical Endurence for Steel Doors and Hardware Reinforcings.
3.	ASTM A653-M97	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4.	ASTM A924-M97	Standard Specification for General Requirements for Sheet, Metalic-Coated by the Hot-Dip Process.
5.	ASTM B117-95	Method of Salt Spray (Fog) Testing.
6.	ASTM C177-97	Test Method for Steady-State heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
7.	ASTM C518-91	Test method for Steady State Heat Flux Measurements and Thermal Transmission properties by means of the heat Flow Meter Apparatus.
8.	ASTM C578-95	Specification for Rigid, Cellular polystyrene Thermal Insulation.
9.	ASTM C665-95	Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
10.	ASTM D1735-92	Practice for Testing Water Resistance of Coating Using Water Fog Apparatus.
11.	CAN4-S104-M80	Fire Tests of Door Assemblies.
12.	CAN4-S105-M85	Standard Specification for Fire Door Frames Meeting the performance required by CAN4-S104.

13. CAN4-S106-M80 Standard Method for Fire Tests of Window and Glass Block Assemblies.

14. CGSB 41-Gp-19Ma Rigid Vinyl Extrusions for Windows and Doors

15. CGSB 82.5-M88 Insulated Steel Doors.

16. CSA A101-M83 Mineral Fiber Thermal insulation for Buildings.

17. CSA W59-M89 Welded Steel Construction (Metal Arc Welding)

18. ISO 9001:1994 Quality Systems – Model for Quality Assurance.

19. NFPA-80, 1999 Fire Doors and Windows

20. CSDMA Dimensional Standards for Commercial Steel Doors and Frames.

21. Manufacturers Standard and Galvanized Sheet Gauges

22. Fleming Fire Labeling Specifications

23. ULC List of Equipment and Materials, Volume 2

1.5 Testing and Performance

1. Door constructions covered by this specification shall be certified as meeting Level “A” (1,000,000 cycles) and Twist Test Acceptance Criteria (deflection not to exceed 6.4 mm /13.6kg force, total deflection at 136.1kg force not to exceed 63.5 mm and permanent deflection not to exceed 3.2 mm) when tested in strict conformance with ANSI-A250.4-1994. Test shall be conducted by an independent nationally recognized accredited laboratory.

2. Fire labeled product shall be provided for those openings requiring fire protection and temperature rise ratings, as determined and scheduled by the Architect. Doors, frames, transom frames and sidelight assemblies shall be tested in strict accordance with CAN4-S106. Product shall be listed by Underwriters Laboratories of Canada under an active Factory Inspection Program and shall be constructed as detailed in Follow-Up Service procedures issued to the manufacturer.

3. Should any door or frame specified by the Architect to be fire rated, not qualify for labeling due to design, hardware, glazing or any other reason, the Architect shall be so advised before manufacturing commences.

4. Core materials for exterior doors shall attain a thermal resistance rating of RSI 1.06 (R6.0) when tested in accordance with ASTM C177 or ASTM C518.

5. Product shall be manufactured by a firm experienced in the design and production of standard and custom commercial steel door and frame assemblies, the integration of

builders' or electronic hardware and glazing materials and their impact on the scope of work.

6. Manufacturer shall be assessed and registered as meeting the requirements of Quality Systems under ISO 9001.

7. Product quality shall meet standards set by the Canadian Steel Door Manufacturers Association.

1.6 Test Reports

1. All alternates to this specification shall be submitted to the Architect for acceptance ten (10) days prior to bid date, complete with test reports from independent, nationally recognized testing authorities, certifying that:
   .1 Steel door and frame assemblies furnished under this section meet the acceptance criteria of ANSI-A250.4-1994, Level "A".
   .2 Insulated door cores furnished in exterior doors under this Section meet the specified thermal resistance rating.

2. All reports shall include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of the test.

1.7 Submittals

1. Submit shop drawings in accordance with the General Conditions of the Contract.

2. Indicate each type of door, frame, steel, core, material thickness, mortises, reinforcements, anchorages, locations of exposed fasteners, openings (glazed, paneled or louvered) and arrangement of standard builders' hardware.

3. Include a schedule identifying each unit, with door marks or numbers referencing the numbering in Architect's schedules or drawings.

4. Provide confirmation in writing that all aspects to reinforcing, construction, and gauge of metal are met as written in this section.

1.8 Warranty

1. All steel door and frame product shall be warranted from defects in workmanship for a period of one (1) year from date of shipment.

2. All steel door and frame product shall be warranted against rust perforation for a period of five (5) years when the installed and finish painted with a commercial quality paint to the manufacturers recommendations.

3. Finish paint adhesion on all door and frame product shall be warranted for a period of five (5) years when the product has been properly cleaned and finish painted with a

commercial quality paint applied as recommended by the paint manufacturer. This warranty shall not exceed that provided by the paint manufacturer.

PART 2 - PRODUCTS

2.1 Doors

2.1.1 Materials

1. Doors shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designation ZF75, known commercially as paintable Galvanneal.

2. Door Cores:
   Honeycomb:
   Structural small cell (25.4 mm maximum) kraft paper "honeycomb". Weight: 36.3 kg per ream (minimum), density: 16.5 kg/m^3 (minimum), sanded to the required thickness.
   .1 Polystyrene:
   Rigid extruded, fire retardant, closed cell board, density 16kg/m^2, thermal values: RSI 1.06 minimum, conforming to ASTM C578.
   .2 Temperature Rise Rated (TRR):
   Solid slab core of non-combustible, inorganic composite to limit temperature rise on the "unexposed" side of door to 250°C at 30 or 60 minutes, as required by governing building code requirements and determined and scheduled by the Architect.

3. Adhesives:
   .1 Honeycomb Cores and Steel Components:
   Heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement or ULC approved equivalent.
   .2 Interlocking Edge Seams:
   Resin reinforced polychloroprene (RRPC), fire resistant, high viscosity, sealant/adhesive or UL approved equivalent.
   .3 Polystyrene Cores:
   Heat resistant, epoxy based, low viscosity, contact cement.
4. Primer:
   Rust inhibitive touch-up only.

5. Exterior Top Caps:
   Rigid polyvinylchloride (PVC) extrusion.

2.1.2 Construction

1. General:
   .1 This section is based on doors and frames as manufactured by Fleming. Doors and frames by other manufacturers are acceptable subject to be similar to the one specified and meeting the terms of this section.

.2 Doors shall be swinging, 44.4 mm thick of the types and sizes indicated on the Architect's schedules or drawings.
.3 Exterior doors shall be lock seam, flush.
.4 Face sheets for exterior doors shall be fabricated from (16) gauge steel.
.5 Longitudinal edges of exterior doors shall be mechanically interlocked, fully welded, ground smooth with no visible seams. Do not fill seams.
.6 Face sheets of interior doors shall be fabricated from 18 gauge steel, except for heavy traffic doors (noted **HT** in Door Schedule) face sheet to be 16 gauge.
.7 Longitudinal edge of heavy traffic doors (noted **HT** in Door Schedule) shall be mechanically interlocked, fully welded, ground smooth with no visible seams. Do not fill seams.
.8 Interior doors shall be stiffened, insulated and sound deadened with honeycomb core laminated under pressure to each face sheet.
.9 Stiffened, insulated and sound deadened with Fleming's propriety core where Temperature Rise Rated (TRR) fire labeled doors are specified on the Architect's schedules.
.10 Longitudinal edges of interior doors shall be mechanically interlocked, adhesive assisted with edge seams visible.
.11 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.
.12 Formed edges shall be true and straight with a minimum radius for the thickness of steel used.
.13 Lock and hinge edges shall be beveled 3 mm in 50 mm unless builders' hardware or door swing dictates otherwise.
.14 Top and bottom of doors shall be provided with inverted, recessed, 16 gauge steel end channels, welded to each face sheet at 150 mm on center maximum.
.15 Exterior doors shall be provided with factory installed flush PVC top caps. Fire labeled exterior doors shall be provided with factory installed flush steel top caps.
.16 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or hardware Suppliers' schedules or details, fire labeled doors shall be provided for those openings requiring fire protection ratings and temperature rise ratings, as determined and scheduled by the Architect.
17. Exterior doors shall be internally reinforced with 20 gauge continuous; interlocking steel stiffeners at 150mm O.C. max, with voids between stiffeners filled and insulated with 24kg/m3 density loose batt type fiberglass material to suit fully welded design.

2. Hardware Preparations:
.1 Doors shall be factory blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templates provided by the hardware supplier.
.2 Doors shall be factory blanked and reinforced only for mortised hardware that is not fully templated.
.3 Doors shall be factory reinforced only for surface mounted hardware.
.4 Templated holes 12.7mm diameter and larger shall be factory prepared, except mounting and through bolt holes, which shall be by the contractor responsible for installation on site, at the time of application. Templated holes less than 12.7mm diameter shall be factory prepared only when required for the function of the

device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes over-lap function holes.

.5 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation on site, at the time of application.

.6 Hinge and pivot reinforcements shall be 10 gauge steel minimum high frequency type reinforcing.

.7 All Hinge reinforcements for acoustic doors and doors in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 127mm heavy weight (4.6mm) high frequency type.

.8 Lock, strike and flush bolt reinforcements shall be 12 gauge steel minimum.

.9 Reinforcements for concealed closers and holders shall be 12 gauge steel minimum.

.10 For surface mounted hardware, reinforcements shall be 16 gauge steel minimum.

.11 All pairs of fire labeled doors shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.

.12 Pairs of doors up to 2450mm x 2450mm, to 1½ hour fire rating maximum shall be provided without astragals. Lock edge seam of such doors shall be tacked-welded and ground smooth. All other fire labeled pairs shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.

.13 Where electrically or electronically operated hardware is specified on the Architects' schedules or details of the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on the templates, shall be provided and interconnected with CSA Approved 12.7mm diameter conduit and connectors.

.14 Prepare doors to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.

.15 Doors and Frames shall be prepared for, but not limited to preparations for heavy weight Butt Hinges, Continuous Hinges, Cylindrical Locksets, Concealed Vertical Rod and Mortise Lock Case Exit Devises, Surface Door Closer and Concealed Overhead Stops.

3. <u>Glazing</u>:

.1 Where 6mm thick glazing materials are specified on the Architects schedules or details, doors shall be provided with 20 gauge steel glazing trim and snap-in glazing stops.

.2 Where other that 6mm glazing is specified on the Architect's schedules or details, doors shall receive 20 gauge steel trim and screw fixed glazing stops. Screws shall be #6 x 32mm oval head scrulox (self-drilling) type at 300mm on center maximum.

.3 Glazing trim and stops shall be accurately fitted, butted at corners, with removable glazing stops located on the 'push' side of the door.

4. Louver Preparations:
   .1 Where specified on the Architect's schedules or details, non-labeled doors shall be prepared on accordance with the louver manufacturer's details.
   .2 Where specified on the Architect's schedules or details, fire labeled doors shall be prepared for UL listed sight-proof fusible link louvers in accordance with the louver manufacturer's details.
   .3 Louvers shall be supplied and installed by others.

5. Finishing:
   .1 Remove weld slag and splatter from exposed surfaces.
   .2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth uniform surfaces.
   .3 On exposed surfaces where zinc coating has been removed during fabrication, doors shall receive a factory applied touch-up primer.
   .4 Primer shall be fully cured prior to shipment.

2.2 Panels

1. Panels shall be fabricated form the same materials, construction and finished in the same manner as doors as specified in Section 2.1.

2.3 Frame Product

2.3.1 Materials

1. Steel:
   Frame product shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designated ZF75, known commercially as paintable Galvanneal.

2. Primer:
   Rust inhibitive touch up only.
3. Miscellaneous:
   .1 Door Silencers:
   GJ-64, Single Stud rubber/neoprene type
   .2 Thermal Breaks:
   Rigid polyvinylchloride (PVC) extrusion
   .3 Fiberglass:
   Loose batt type, density: 24kg/m^3 (minimum), conforming to ASTM C665

2.3.2 Construction

1. General:
   .1 All steel frame product shall be as manufactured by Fleming of the types, sizes and profiles indicated on the Architects' schedules or details.
   .2 Exterior frames shall be thermally broken, Fleming *Therma-Frame* Series, fabricated from 16 gauge steel.
   .3 Exterior frame product shall be supplied profile welded (PW)

.4 Interior and exterior sections of thermally broken frames shall be separated by a continuous PVC thermal break.
   1. Thermally broken sections shall not be assembled by means of screws, grommets or other fasteners and welds shall not cause thermal transfers between interior and exterior surfaces of the frame sections.
   2. Closed sections (mullions and center rails) of thermally broken frames shall be factory insulated with 24kg/m^3 loose batt type fiberglass material.

.5 Insulation of open sections (jambs, heads and sills) on exterior frame product shall be provided and installed by the contractor responsible for installation.

.6 Interior frames shall be Fleming F-Series, fabricated from 16 gauge steel.

.7 Interior frame product shall be supplied profile welded (PW)

.8 Knocked-down and knocked-down drywall frames shall not be acceptable.

.9 Jambs, heads, mullions, sills and center rails shall be straight and uniform throughout their lengths.

.10 Frame product shall be square, free of defects, wraps or buckles.

.11 Corner joints shall be profile welded (PW) (continuously welded on the inside of the profiles' faces, rabbets, returns and soffit intersections with exposed faces filled and ground to a smooth, uniform, seamless surface)"

.12 Joints at mullions, transom bars, sills or center rails shall be coped accurately, butted and tightly fitted, with faces securely welded, matching corner joint faces.

.13 All steel mullions will be fabricated from the same materials as specified for the steel frames. Steel mullions will be fabricated as a fully assembled three piece unit consisting of a front, back and full height one piece attachment clip as per Fleming F Series. The attachment clip will completely fill the stop area of the mullion on both sides and span the void between each side forming a grid channel like structure. Mullions used as hinge mullions or strike mullions between doors will be filled with grout by the general contractor either prior to or following installation of the frame. The head of the frame shall have an opening sufficient for the grout to be poured in to the mullion.

.14 Mullions shall be fabricated with continuous 20 gauge galvanneal steel internal reinforcing clips.

.15 Frame product shall be fabricated with integral door stops having a minimum height of 16mm.

.16 Glazing stops shall be formed 20 gauge steel, 16mm height channel, accurately fitted, butted at corners and fastened to frame sections with #6 x 32mm oval head scrulox (self-drilling) type screws at 300mm on center maximum.

.17 Where required due to site access, as indicated on the Architects' schedules or details, when advised by the contractor responsible for co-ordination or installation, or when shipping limitations so dictate, frame product shall be fabricated in sections for splicing in the field.
   1. Field spliced jambs, heads and sills shall be provided with 16 gauge steel splice plates securely welded into one section, extending 100mm minimum each side of splice joint.
   2. Field splices at closed sections (mullions or center rails) shall be 16 gauge steel splice angles securely welded to the abutting member. Face of splice angle shall extend 100mm minimum into closed sections when assembled.

3. Field splice joints shall be welded, filled and ground to present a smooth uniform surface by the contractor responsible for installation after assembly.

.18 Each door opening shall be provided with two (2) temporary steel jamb spreaders welded to the base of the jambs or mullions to maintain proper alignment during shipping and handling. Spreaders shall be removed by the contractor responsible for installation prior to anchoring of frame to floor.

.19 Each door opening shall be prepared for GJ-64 or equivalent, single stud door silencers, three (3) for single door openings, two (2) for double door openings. Silencers shall be shipped loose for installation by the contractor after finish painting.

.20 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or Hardware Suppliers' schedules or details, fire labeled frame product shall be provided for those openings required fire protection ratings as determined and scheduled by the Architect.

2. Hardware Preparations:
   .1 Frame product shall be blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templated provided by the hardware supplier.
   .2 Frame product shall be factory blanked and reinforced only for mortised hardware that is not fully templated.
   .3 Frame product shall be reinforced only for surface mounted hardware.
   .4 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation on site, at the time of application.
   .5 Frames shall be prepared for 114.3mm standard weight hinges (minimum).
   .6 Hinge and pivot reinforcements shall be 10 gauge steel minimum reinforcing, high frequency type shall be provided.
   .7 Hinge reinforcements for acoustic frames and frames in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 114.3mm heavy weight (4.6mm) high frequency type.
   .8 Strike reinforcements shall be 16 gauge steel minimum.
   .9 Reinforcements for surface mounted hardware, concealed closers and holders and flush bolts shall be 12 gauge steel minimum.
   .10 Mortised cutouts shall be protected with 22 gauge steel minimum guard boxes.
   .11 Where electrically or electronically operated hardware is specified on the Architects schedules or details or the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on templates, shall be provided and inter-connected with CSA Approved 12.7mm diameter conduit and connectors.
   .12 Prepare frames to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.

3. Anchorage:
   .1 Frame product shall be provided with anchorage appropriate to floor, wall and frame construction.

.2 Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb, except as indicated below.
.3 Frame product installed in unit masonry partitions shall be provided with 4.0mm diameter steel wire anchors, 18 gauge steel adjustable stirrup and strap or "T" type anchors as conditions dictate.
.4 Where frame product is installed prior to construction of the adjacent wall, each jamb shall be provided with 16 gauge steel floor anchors. Each anchor shall be provided with two (2) holes for mounting to the floor and shall be securely welded to the inside of the jamb.
.5 Floor anchors for thermally broken exterior frames shall be designed so as not to permit thermal transfers from exterior to interior surfaces of the frame sections.
.6 Frame product installed in drywall partitions shall be provided with 20 gauge steel snap-in or "Z" type stud type anchor.
.7 Jambs of frames in previously placed concrete, masonry or structural steel shall be punched and dimpled to accept machine bolt anchors, 6.4mm diameter, located not more than 150mm from the top and bottom of each jamb. Anchor preparations and guides shall also be located immediately above or below the intermediate hinge reinforcings and directly opposite on the strike jamb. Each preparation shall be provided with 16 gauge anchor bolt guides.
.8 Anchor bolts and expansion shell anchors for the above preparations shall be provided by the contractor responsible for installation.
.9 After sufficient tightening of the anchor bolts, the heads shall be welded do as to provide a non-removable application. Welded bolt head and dimple shall be filled and ground to present a smooth uniform surface by the contractor responsible for installation, prior to finish painting.
.10 Where indicated on the Architects' schedules or details, channel extensions shall be provided from the top of the frame assembly to the underside of the structure above. Extensions shall be fabricated from 12 gauge steel formed channel, mounting angles welded to inside of frame head and adjusting brackets. Formed channels, adjusting brackets and fasteners shall be shipped loose. Channels shall be mechanically connected to mounting angles and adjusting brackets with supplied fasteners, on site, by contractor responsible for installation.

4. Finishing:
   .1 Remove weld slag and spatter from exposed surfaces.
   .2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth and uniform surfaces.
   .3 On exposed surfaces where zinc has been removed during fabrication, frame product shall receive a factory applied touch-up primer.
   .4 Primer shall be fully cured prior to shipment.

2.4 Sizes and Tolerances

1. All sizes and tolerances shall be in accordance with the Canadian Steel Door Manufacturers Association "Recommended Dimensional Standards for Commercial Steel Doors and Frames" as follows:

.1 Widths of door openings shall be measured from inside of frame jamb rabbet with a tolerance of +1.6mm, -0.8mm.
.2 Heights of door openings shall be measured from the finished floor (exclusive of floor coverings) to the head rabbet of the frame with a tolerance of ± 1.2mm.
.3 Unless builders' hardware dictates otherwise, doors shall be sized so as to fit the above openings and allow a 3mm clearance at jambs and head. A clearance of 19mm between the bottom of the door and the finished floor (exclusive of floor coverings) shall be provided. Tolerances on door sizes shall be ± 1.2mm.
.4 Manufacturing tolerances on formed frame profiles shall be ± 0.8mm for faces, door stop heights and jamb depths. Tolerances for throat openings and door rabbet shall be ± 1.6mm and ± 0.4mm respectively. Hardware cutout dimensions shall be as per template dimensions, +0.4mm, -0.

2.5 Hardware Locations

1. Hardware preparations in frame product shall be as noted below and locations on doors shall be adjusted for clearances specified in 2.4.

2. Top of upper hinge preparation for 114.3mm hinges shall be located 180mm down from head, transom mullion or panel as appropriate. The top of the bottom hinge preparation for 114.3mm hinges shall be located 310mm from finished floor as defined in 2.4.3. Intermediate hinge preparations shall be spaced equally between top and bottom cutouts. For dutch door frames, top and bottom hinge locations shall be as above, with the tops of intermediate hinges located at 930mm and 1403mm from finished floor.

3. Strike preparations for unit, integral, cylindrical and mortise locks and roller latches shall be centered 1033mm from finished floor. Strikes for deadlocks shall be centered at 1200mm from finished floor. Strikes for panic or fire exit hardware shall be located as per device manufacturer's templates.

4. Push and/or pulls on doors shall be centered 10701mm from finished floor.

5. Preparations not noted above shall be as per hardware manufacturer's templates.

6. Hardware preparation tolerances shall comply with the ANSI A115 series standards.

PART 3 - EXECUTION

3.1 Site and Protection of Materials

1. The contractor responsible for installation shall remove wraps or covers from door and frame product upon delivery at building site.

2. All materials shall be thoroughly inspected upon receipt and all discrepancies, deficiencies and/or damages shall be immediately reported in writing to the supplier, All damage shall be noted on the carriers' Bill of Landing.

3. Contractor responsible for installation shall ensure all materials are properly stored on planks or dunnage in a dry location. Product shall be stored in a vertical position, spaced with blocking to permit air circulation between them. Materials shall be covered to protect them from damage from any cause.

4. Contractor shall notify the supplier in writing of any errors or deficiencies in the product itself before initiating any corrective work.

3.2 Installation

1. Install doors and frames in accordance with the Door and Hardware Institute "Installation guide for doors and hardware".

2. Set frame product plumb, square, aligned, without twist at correct elevation.

3. Frame Product Installation Tolerances:
   .1 Plumbness tolerance, measured through a line from the intersecting corner of vertical members and the head to the floor, shall be $\pm$ 1.6mm.
   .2 Squareness tolerance, measured through a line 90^0 from one jamb at the upper corner of the product, to the opposite jamb, shall be $\pm$ 1.6mm.
   .3 Alignment tolerance, measured on jambs, through a horizontal line parallel to the plane of the wall, shall be $\pm$ 1.6mm.
   .4 Twist tolerance, measured at face corners of jambs, on parallel lines perpendicular to the plane of the wall, shall be $\pm$ 1.6mm.

4. Fire labeled product shall be installed in accordance with NFPA-80.

5. Secure anchorages and connections to adjacent construction.

6. Brace frame product rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at mid points of frame rabbet height and at floor level to maintain frame widths. Provide vertical support at center of head for openings exceeding 1250mm in width. Remove wood spreaders after product has been built-in.

7. Frame product in unit masonry shall be fully grouted in place.

8. Install doors maintaining clearances outlined in Section 2.4.

9. Install louvers and vents.

10. Adjust operable parts for correct clearances and function.

11. Steel surfaces shall be kept free of grout, tar or other bonding materials or sealers.

12. Any grout or other bonding material shall be cleaned from products immediately following installation.

13. Exposed field welds shall be finished to present a smooth uniform surface and shall be touched-up with a rust inhibitive primer.

14. Exposed surfaces that have been scratched or otherwise marred during shipment, installation or handling shall be touched-up with a rust inhibitive primer.

15. Finish paint in accordance with Section 09900.

16. Install glazing materials and door silencers.

End of Section

PART 1 - GENERAL

1.1 SECTION INCLUDES

Wood doors non-rated.

1.2 RELATED SECTIONS

Section 06200 - Finish Carpentry
Section 08700 - Finish hardware
Section 08800 – Glazing

1.3 REFERENCES AND REGULATORY REQUIREMENTS

A NFPA 252 - Standard Methods for Fire Assemblies.
B. Quality Standards:
1. WDMA Industry Standard I.S. 1-A-2021
2. AWI Quality Standards 8th Edition, Version 1.0 2021
3. ANSI A115. W Series, Wood Door Hardware Standards.

1.4 SUBMITTALS

A. Submit under provisions of Section 01340.
B. Shop drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts, special beveling, hardware blocking in mineral core doors, identify cutouts.
C. Indicate compliance with specified fire rating.
D. Product Data: 1 ¾ solid oak members.
E. Construction samples: Submit one or more of manufacturer's standard samples demonstrating door construction.
F. Finish samples: Stain selection by Architect.
G. Manufacturer's full lifetime warranty
H. FSC Chain of Custody certified MR 7
I. SCS Recovered Fiber Content Certification MR 4.1, 4.2
J. No added Urea Formaldehyde IEQ 4.
K. Glass size: Refer to drawings for glass size.

1.5 QUALITY ASSURANCE

A. Meet or exceed WDMA I.S.1-A Premium Grade.

1.6 DELIVERY STORAGE AND HANDLING AND SITE CONDITIONS

A. Deliver, store, protect and handle products under provisions of WDMA, AWI, WIC and manufacturer's care and handling instructions.
B. Accept doors on site in manufacturer's standard packaging. Inspect for damage. Do not store in damp or wet areas. HVAC systems should be operating and balanced prior to arrival of doors. Acceptable humidity shall be no less than 25% nor greater than 55%.
C. Protect doors from exposure to natural and artificial light after delivery.

1.7 COORDINATION

A. Coordinate work under provisions of Section 01620.
B. Coordinate the work with door opening construction, door frame and door hardware installation with a pre-installation conference.

1.8 WARRANTY

A. Provide manufacturer's warranty for one-year.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Marshfield DoorSystems, Inc., Marshfield Signature Series™ quality as defined in this section or equal.

B. Substitutions allowed only if approved by the architect prior to bid date.

2.2 MATERIALS

A. **WORKMANSHIP**

1. Comply with WDMA workmanship for veneer faces, vertical edges, crossbands, horizontal edges and dimensional tolerances.

B. **DOOR CONSTRUCTION GRADE**

1. Except as otherwise shown on the drawings fabricate the work of this section to WDMA “Premium Grade”

C. **WOOD DOOR FACING**

1. Wood Veneer (5-Ply): (Choose from the selection of grade, species, cuts and color as detailed by WDMA G-6 through G-11).

D. **VENEER MATCHING**

1. Book Match, Slip Match (See WDMA G-7).

E. **ASSEMBLY OF SPLICED VENEERS**

1. Running book match (standard unless otherwise noted), Balance match, Center balance match. (See WDMA G-8).

F. **DOORS IN PAIRS OR SETS**

1. Specify per project requirements. (See WDMA G-9 / AWI Section 1300 G14). Door schedule shall reflect pairs and sets by door numbers, including doors separated by a mullion.

G. **GLAZING OF FLUSH WOOD DOORS**

1. Glazing shall be under section 08800.
   a. Glass as selected by architect.

2.3 FABRICATION

A. **DOOR AND TRANSOM PANEL CORE CONSTRUCTION**

1. Fire-rated Marshfield Signature Series™: ANSI A208; (Select 1).
   a. 1-LD-2 Particleboard, DPC-1; [or]
   b. Structural Composite Lumber; DCL-1 [or]
   c. Kiln Dried Staves with one species per core; DSC-1
   d. Environmental Class; ESC-1 (Staved Core, assists in meeting MR 7, IEQ 4.4,

HORIZONTAL EDGES (RAILS)

1. No MDF top and bottom rails permitted
2. As required to meet positive pressure ratings.

ADHESIVES

1. Face Adhesive: Type 1.

MACHINING

1. Factory fit and machine doors for frame and finish hardware in accordance with hardware and NFPA 80 requirements and dimensions. Do not machine for surface hardware. Apply appropriate fire labels.

2.4 ACCESSORIES

GLAZING STOPS

1. Non-Rated:
   a. Wood, of the same species/compatible with door species (or)
   b. Metal Vision Frames.
   c. W-8 Reveal Lite Molding

GLASS & GLAZING IN WOOD DOORS

1. Glass and glazing provided by the wood door manufacturer

2.5 FACTORY FINISH

A. Factory finish doors in accordance with WDMA G-17 Finish System Description or AWI Division 1500–S-4 – Finish System Standards. Factory finish to be water based stain and ultraviolet (UV) cured polyurethane to comply with EPA Title 5 guidelines for Volatile Organic Compound (VOC) emissions limitations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that opening sizes and tolerances are acceptable and ready to receive this work.

B. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.2 INSTALLATION

1. Install fire-rated and non-rated doors in accordance with NFPA 80, manufacturers' instructions and to ITS-WH/UL requirements.
2. Trim non-rated door width by cutting equally on both jamb edges.
3. Trim door height by cutting bottom edges to a maximum 3/4 inch (19-mm).
4. Trim fire door height at bottom edge only, in accordance with fire rating requirements.
5. Pilot drill screw and bolt holes using templates provided by hardware manufacturer
6. Coordinate installation of doors with installation of frames and hardware
7. Manufacturer shall install glass in wood doors
8. Reseal or refinish any doors that required site alteration.

3.3 WARRANTY TOLERANCES

Conform to WDMA standards and testing methods for warp, cup, bow and telegraphing.

3.4 ADJUSTING

Adjust doors for smooth and balanced door movement.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Final Cleaning: Section 01710
2. Commercial Steel Doors and Frames Section 08100

1.2 Submittals

1. Submit a 300 x 300 sample of all glass products in accordance with Section 01340.

1.3 Warranty

1. Contractor hereby warrants glass against defects and failure, including leakage, under normal conditions of use, in accordance with Division 1, but for two (2) years total.

PART 2 - PRODUCTS

2.1 Material

1. **Interior Tempered Safety Glass:** All interior Vision Glass to non-fire rated interior doors and screens to be tempered 6 mm tempered clear float glass complete with etched tempered glass designation visible.
2. **Polished Plate or Float Glass:** To CAN/CGSB-12.3 clear.
3. **Fire Rated Glass**: To CAN 4 S-104 and CAN 4 S-106 to meet ANSI Z97.1. Shall be 3/16” (5mm) thick FireLite-Premium supplied by TechniGlas.
4. **Setting blocks:** neoprene, 80 durometer hardness, 102 mm x 6 mm width to suit glass.
5. **Glazing tape:** preformed butyl with continuous spacer, 10-15 durometer, hardness, paper release, black color, 3 x 10 mm.
6. **Gasket:** black neoprene "U" cavity type with lock strip.

PART 3 - EXECUTION

3.1 Installation

1. **Glass**
   .1 Clean and dry surfaces.
   .2 Apply glazing tape to fixed stops. Place setting blocks at 1/3 points.
   .3 Set glass on setting blocks against tape.
   .4 Apply glazing tape to glass.
   .5 Install stops.
   .6 Install glass in doors and screens with neoprene gasket.
   .7 Clean glass prior to building occupancy in accordance with Section 01710.

End of Section

PART 1 - GENERAL

1.1 General Finish Notes

1. The Material and Colour Schedule will be issued by the Consultant after tender. It shall be read in conjunction with the Drawings, Specifications, Room Schedule and Door Schedule. Colour and material references named will be based on one manufacturer, as carried by the Contractor or, in the case that no specific manufacturer is carried, based on the Consultant's choice.

2. Approved alternative manufacturers will be acceptable only as indicated in the specifications. However, approved alternate products submitted must match the products named in the Specification to the Consultant's selection. Alternate products other than those named in the specifications will not be allowed unless previously approved by the Consultant.

3. Consult Architect prior to painting any surface not included in the formulae as listed.

4. Final colour for exterior painted surfaces and prominent interior areas shall be approved on the job site by the Architect.

5. Paint samples: Contractor to submit paint samples for all areas required to "Match Adjacent Finish".

6. All similar paint formulations are to be identical when dry. Variations in tone, texture or sheen shall not be accepted.

7. Submit two 300 mm x 300 mm paint samples of each colour required for approval by the Architect.

8. Exact locations of accent paint called for in the Material and Colour Schedule, to be issued after Contract award, not specifically identified on the drawings are to verified on site with the Architect.

1.2 Exterior Finish Notes

1. All exposed metal (doors, frames, lintels, stairs, handrails, mechanical equipment, etc.) to be painted except for prefinished metal louvres, stainless steel, and aluminum. Mechanical equipment is to be painted whether delivered to the site prepainted or not (exhaust fans, goosenecks, exhaust stacks, supports, HVAC units, HRU units, etc.). Colours to match adjacent material-generally either to match brick or tan to match flashing or siding material. Do not paint exposed white PVC pipe covers on interior. Architect will advise on jobsite which other items mentioned above, if any, do not require painting.

1.3 Interior Finish Notes:

1. All heating units, recessed convectors, grilles, pipes, access panels, hangers and miscellaneous exposed metal work (except stainless steel or anodized aluminum) to be painted to match the surfaces on which they occur unless noted otherwise on the colour schedule, prefinished in suitable colour or directed by the Architect. If prefinished equipment is damaged, it shall be re-painted. Painting to be by formulations specified in Section 09900.

2. All interior fitments, casework, millwork, etc. to be melamine unless otherwise noted. Refer to Sections for specific requirements regarding materials, construction, finishes and hardware. Note that drawer and cupboard interiors are to be considered as exposed surfaces and will therefore be finished.

3. Do not paint over nameplates, identification tags, etc.

4. Make good all existing surfaces and finishes that are damaged during construction.

1.4 Abbreviations Legend

1. Refer to Room Finish Schedule (Refer to Drawings).

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Gypsum Board: Section 09250

1.2 Reference Standards

1. Do work to CSA A82.31-1977, except where specified otherwise.

PART 2 - PRODUCTS

2.1 Materials

1. Non-load bearing channel stud framing: to ASTM C645-76, roll formed from 0.59 mm thickness electro-galvanized steel sheet for screw attachment of gypsum lath and metal lath. Knock out service holes at 150 mm o.c.

2. Floor and ceiling tracks: to ASTM C645-76 in width to suit stud sizes, 30 mm legs for floor track, 50 mm for ceiling track.

3. Metal channel stiffener: 38 mm size, 2 mm thick cold rolled galvanized steel.

4. Furring channels (channels, hangers, tie wire, insert, anchor): CSA A82.30-1965 (R-1971).

5. Metal Accessories: CSA A82.30-1965 (R-1971).

PART 3 - EXECUTION

3.1 Stud Partitions

1. Align partition tracks at floor and underside of structure above and secure at 600 mm o.c. maximum. All partitions to extend to underside of structure above.

2. Place studs vertically at 400 o.c. and not more than 50 mm from abutting walls and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs, as required, to provide rigid installation to manufacturer's instructions.

3. Erect metal studding to tolerance 1:1000.

4. Attach studs to bottom track using screws.

5. Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs, ensure web openings are aligned.

6. Install steel frames and anchor frames securely to studs using minimum of three (3) anchors per jamb for jambs up to 2100 mm high and a minimum of four (4) anchors per jambs for jambs over 2100 mm high.

7. Provide two (2) studs at each side of openings wider than stud centre specified.

8. Install, cut to length, piece of runner horizontally over door frames and at top and bottom of rough opening in glazed partitions.

9. Provide 38 mm x 89 mm vertical and horizontal wood studs secured between metal studs for attachments of bathroom fixtures, accessories, cabinet work, and other fixtures, including grab bars, towel rails, attached to steel stud partitions.

10. Install steel stud or furring channel between studs for attaching electrical and other boxes.

11. Extend all partitions to underside of deck above for sound and fire separation.

12. Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.

3.2 Ceiling Furring

1. Install runners level to tolerance of 3 mm over 3.5 m. Provide runners at interruptions of continuity and change in direction.

2. Frame with furring channels, perimeter of openings to accommodate access panels, light fixtures, diffusers, grilles, etc.

3. Furr for bulkheads within or at termination or ceilings.

4. Install furring channels at 400 mm o.c. maximum.

3.3 Wall Furring

1. Install steel furring, as indicated.

2. Frame opening and around built-in equipment on four (4) sides with channels.

3. Box-in beads, columns, pipes, and around exposed services.

3.4 Fire-rated Assemblies

1. If required, install Metal Stud System and Furring in accordance with appropriate ULC Design and with supplement to the National Building Code of Canada 2015.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Masonry: Section 04200
2. Metal Stud System: Section 09111
2. Supply of access doors for mechanical and electrical devices refer to Drawings

1.2 Reference Standards

1. Do work to CSA A82.31-1977, except where specified otherwise.

PART 2 - PRODUCTS

2.1 Gypsum Board

1. Plain: to CSA A82.27-M1977 standard, 13mm, 16mm or 19mm thick or as indicated, tapered edges.
2. Plain: to CSA A82.27-M1977, Fire-rated Type X, 16 mm thick or as indicated, tapered edges.
3. Plain: to CSA A82.27-M1977 standard, 13 mm Denshield board where finished surface to be ceramic wall/ceiling tile.

2.2 Fastenings and Adhesives

1. Screws: to CSA A82.31-1977.
2. Adhesive: to CGSB 71 GP 25M.
3. Laminating Compound: to CSA A82.31-1077.
4. Concrete Anchors: Phillips Red Head TW-614 or equivalent. Do not use powder activated fasteners for ceiling support.
5. Tie Wire: #16 ga. galvanized soft annealed steel wire.

2.3 Accessories

1. Casing Beads and Corner Beads: 0.5 mm base thickness commercial sheet steel with G90 zinc finish to ASTM A 525-78 A.
2. Joint compound and tape: Compound to CSA A82.31-1977, asbestos-free. Perforated 50 mm gypsum board joint tape.
3. Caulking: Acoustical sealant.

2.4 Insulation Blanket

1. Ruxol sound attenuation blankets.

PART 3 - EXECUTION

3.1 Gypsum Board Application

1. Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.

2. Install metal studs plumb and true to sizes and locations indicated on drawings.

3. Apply single and double layers gypsum board to metal furring or framing, using screw fasteners and laminating adhesive. Maximum spacing of screw 300 mm oc.

4. Apply gypsum board to concrete block surfaces, where indicated, using laminating adhesive.

5. Apply type X gypsum board where indicated, in accordance with U.L.C. requirements and with supplement to the National Building Code of Canada to obtain the required fire protection, fire rating and fire separation.

3.2 Insulation and Blanket Application

1. Where indicated on drawings, staple blanket to wallboard in accordance with ULC design requirements. Blanket shall be continuous and tightly fitted between studs and at perimeter.

3.3 Accessories

1. Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces, where practical. Make joints tight, accurately aligned and rigidly secure. Mitre and fit corners accurately, free from rough edges.

2. Install casing beads around perimeter of suspended ceilings.

3. Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.

3.4 Access Doors

1. Install access doors to electrical and mechanical fixtures specified in respective Sections.

2. Rigidly secure frames to furring or framing systems.

3.5 Taping and Filling and Sound Seal

1. Seal with acoustical sealant at ceilings, floors, wall intersections and all penetrations such as electrical outlets.

2. Finish face panel joint and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

3. Finish corner beads, control joints and trim as required with two (2) coats of joint compound and one (1) coat of taping compound, feathered out onto panel faces.

4. Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

5. Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

6. Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Demolition: Section 02050

2. Caulking: Section 07900

1.2 Reference Standards

1. Do tile work to Installation Manual 2009-2010, "Tile Installation Manual", produced by Terrazzo Tile and Marble Association of Canada (TTMAC), except where specified otherwise.

1.3 Maintenance Material

1. Provide maintenance data for tile work for incorporation into Maintenance Manual specified in Section 01720.

2. Provide 12 additional tiles of each type and color of tile required for project for maintenance use. Store where directed. Clearly identify each box.

3. Maintenance material to be of same production area as installed material.

1.4 Environmental Requirements

1. Air temperature and structural base temperature at tile installation area must be above 13 degrees C for 24 hours before, during and 24 hours after installation.

1.5 Extended Warranty:

1. Submit a warranty for entire flooring tile installation, covering materials and labour and the repair or replacement of defective work for three (3) years total.

PART 2 - PRODUCTS

2.1 Tiles

1. Designation **PT**: 300 mm x 600 mm porcelain tile to CAN 2-75-1M77.

    .1 Acceptable material: Linear-Stone series, distributed by Centura. Size 29.5cm x 58.9cm, matte finish. Allow 2 colors from manufacturer's full line.

    .2 Acceptable Alternates: Le Pietra distributed by Olympia, match size.
    Java Joint Porcelain by Crossville, match size
    By Daltile, match size.

2.2 Accessories

1. Stair Nosing Strip: Schluter TREP-SE/-S/-B slip resistant stair nosing.
Location: Interior Exit Stairs.

2. Control Joints – Schluter – Dilex –KSN for floors and walls with Tiles.

2.3 Setting Materials

1. Cement Mortar: Mixture of 1 part Portland cement, 4 parts dry sand and 1/10 hydraulic lime. Materials shall conform to the following:

2. Portland Cement: To CAN3-A, Type 10.

3. Hydrated Lime: To ASTM C-206 or 207, Type 5.

4. Sand: To CSA A82.56, passing 1.6 mm sieve.

5. Water: Potable, containing no contaminants which cause efflorescence.

6. Thin Set Mortar: premium grade “Kerabond/Keralastic” high performance two part system with flexible acrylic latex additive, by Mapei.

    .1 Acceptable Alternates: “Laticrete 254 Platinum., or Flextile 52 premium grade.

2.4 Grout

1. Sanded, Portland cement based with Plastijoints acrylic additive, Ultra/colour by Mapei. Colour as selected by Architect.

PART 3 - EXECUTION

3.1 Workmanship

1. Apply tile to clean and sound surfaces.

2. Fit tile units around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance. Make cut edges smooth, even and free from chipping. Edges resulting from splitting not acceptable.

3. Maximum surface tolerance: 1:800.

4. Make joints between tiles uniform and approximately 3 mm wide, (maximum 4 mm) plumb, straight, true, even and with adjacent units flush. Align patterns.

5. Lay out units so perimeter tile are minimum 1/2 size.

6. Sound tiles after setting and replace hollow sounding units to obtain full bond.

7. Make internal angles square, external angles chamfered at 45° with narrow tile strip.

8. Construct base, as indicated on drawings, with rounded top edge.

9. Use bullnose edged tiles at termination of wall tiles, except where tiles abut projecting surface or differing plane.

10. Seal grouted joints with sealer.

11. Clean installed tile surfaces after installation cured.

12. Keep building expansion joints free of mortar or grout.

3.2 Setting System

1. Install porcelain floor tiles in accordance with TTMAC applicable thinset detail.

End of Section

1.0 GENERAL

1.1 Related Documents

Drawings and general provisions, including General and Supplementary Conditions of the Contract and Division I Specification sections, apply to this section.

1.2 Applicable Publications

The following publications listed here and referred to thereafter by alphanumeric code designation only, form a part of this specification to the extent indicated by the references thereto:

1) ASTM International (ASTM):
C503-99e1 Standard Specification for Marble Dimension Stone (Exterior)
C97-02 Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
C99-87(2000) Standard Test Method for Modulus of Rupture of Dimension Stone
C170-90(1999) Standard Test Method for Compressive Strength of Dimension Stone
C241-90(1997) Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic
C880-98 Standard Test Method for Flexural Strength of Dimension Stone

2) Marble Institute of America (MIA):
Membership, Products, and Services Directory, Dimension Stone Design Manual, Dimension Stones of the World, Volumes I and II (includes color plates, ASTM test data, and other technical information). Additional publications may be available from the MIA Bookstore–go online at www.marble-institute.com.

1.3 Scope of Included Work

The work to be completed under this contract includes all labor and materials required for the furnishing and installation of all marble work shown or called for on the contract drawings, specifications, and addenda.

1.4 Definition of Terms

The definitions of trade terms used in this specification shall be those published by the MIA or ASTM International.

1.5 Source of Supply

All marble shall be obtained from quarries having adequate capacity and facilities to meet the specified requirements and by a firm equipped to process the material promptly on order and in strict accord with specifications. The Specifying Authority (architect, designer, engineer, contracting officer, end user etc.) reserves the right to approve the Material Supplier prior to the award of this contract. Stone and workmanship quality shall be in accordance with Industry Standards and Practices as set forth by the MIA.

1.6 Samples

The Marble Contractor shall submit through the General Contractor, for approval by the Specifying Authority, at least two full range sets of samples of the various kinds of marble specified. Sample submittals shall represent the full range of color and markings inherent in the material proposed for fabrication of the project. Full range sample sets must be reviewed and approved as a complete set and not as individual pieces. Full range sample sets shall be indicative of the true character, including any natural variation in background and foreground color, veining or graining, of the material currently available and proposed for use on the project. The sample size shall be 1′-0″ x 1′-0″ minimum, 2’-0” x 2’-0” minimum for heavily veined or varied stones, and shall represent approximately the finish, texture, and anticipated range of color to be supplied. Where necessary to show variations in color and markings, larger samples or range sets of samples should be submitted. If marble is to be matched, a minimum of two sets each containing four matched samples showing proposed veining and range of color in each set must be supplied. Samples designating finished face shall be clearly labeled on the back with the name of the marble, the group classification for soundness, and the use for which the marble is intended. One set of samples shall be retained by the Specifying Authority, and one set shall be returned to the Marble Supplier for his/her record and guidance. It is noted herein that marble is a natural material and will have intrinsic variations in color, markings, and other characteristics. Depending on the marble selected and quantity required, a range mockup may be used to further define the characteristics of the material. Cost of mockup, if required, shall not be included in this section. Prior to fabrication, and to assure the end user’s needs will ultimately be met and to fully understand the finish and full range of the material, an inspection and approval by the Specifying Authority and/or General Contractor and/or End User of the material is recommended. Costs for an initial inspection of the quarried blocks before slabbing, and a second inspection of the finished material slabs before fabrication shall be stipulated and included in the overall contract requirements.

1.7 Shop Drawings

The Marble Contractor shall submit through the General Contractor, for approval by the Specifying Authority, sufficient sets of shop drawings showing general layout, jointing, anchoring, stone thickness, required setting spaces and such other pertinent information. These drawings shall show all bedding, bonding, jointing, and anchoring details along with the net piece dimensions of each marble unit. Due to tight fabrication tolerances of dimensional stone (see “Dimensional Tolerances” in this section) special attention must be paid to those areas where associated trade’s work abuts or is integral with the stone installation. Additional notes calling out required setbacks, setting space allowances below and behind floor and wall installations, critical “hold-too” dimensions, or any other specific conditions requiring strict coordination with other trades work should be incorporated into the shop drawings. Coordination of approved shop drawings with all affected trades is the responsibility of the General Contractor. One copy of approved drawings shall be retained by the Specifying Authority, one copy shall be retained by the General Contractor, and one copy returned to the Marble Contractor for fabrication. NO FABRICATION OF MARBLE SHALL BE STARTED UNTIL SUCH DRAWINGS HAVE BEEN FULLY APPROVED AND MARKED AS SUCH. The General Contractor shall furnish all field dimensions necessary for fabrication. If measurements are not established and guaranteed in advance, the Marble Contractor shall obtain and verify measurements at the building.

1.8 Defective Work

Any piece of marble showing flaws or imperfections upon receipt at the storage yard or building site shall be referred to the Specifying Authority for determination as to responsibility and decision as to whether it shall be rejected, patched, or redressed for use.

2.0 MATERIALS

2.1 Marble

General: All marble shall be of kind or kinds shown on the Architect’s drawing or as specified herein, conforming to or within the range of approved samples and in accordance with the characteristics and working qualities set forth under their respective Soundness Group Classifications, A, B, C, or D, as defined by the Marble Institute of America. Care shall be taken in selection to produce as harmonious effects as possible. Patching and waxing, where permitted under the Marble Institute of America Group Classifications, shall be carefully done to conform to the marble’s general character and finish. Texture and finish shall be within the

range of sample(s) approved by the Specifying Authority. Finishes: Finishes listed in the schedule shall conform with definitions by MIA or ASTM International.
Polish finish: A mirror like, glossy surface which brings out the full color and character of the marble. This finish is not recommended for exterior or commercial floor use.
Honed finish: A velvety smooth surface with little or no gloss.

Marble Type A Boticcino Marble – at all walls

Marble Type B White Marble – Calacatta Chiaro – at baseboard trim

2.2 Setting Mortar (and Adhesives)

All proposed setting materials shall be tested by the Marble Contractor to assure that there is no staining to the specified stone. Light colored and green marbles are typically more susceptible to staining and require additional consideration to avoid damage to stone during installation. Portland cement shall conform to the requirements of the Standard Specifications for Portland Cement, ASTM C150-02a. White Portland cement is recommended for white or light-colored marble. Nonstaining cement shall conform to the requirements of the Standard Specifications for Masonry Cement, ASTM C91-03. Molding plaster (plaster of Paris) shall conform to the requirements of the Standard Specifications for Gypsum Molding Plaster, ASTM C59/C59M-00.
Sand. All sand shall be clean, free from organic and other deleterious matter likely to stain the finished work, and shall be screened as required for the desired results.
Portland cement shrinkage-reducing accelerator used with Portland cement to give it the quick-setting characteristics of plaster of Paris, shall be a nonstaining admixture that will not corrode anchors or dowels.
Nonstaining adhesive shall be of a type that will not stain the marble, that is not affected by temperature changes or moisture, and that adheres with strong suction to all clean surfaces.

2.3 Pointing Mortar

Mortar for pointing shall be Type N, as defined in ASTM C270-03 (Standard Specification for Mortar for Unit Masonry). All mixing, handling, and pacing procedures shall be in accordance with ASTM C270-03.

2.4 Anchors, Cramps, and Dowels

Anchors, cramps, and dowels shall be made of corrosion-resistant metals. Special cramps, dowels, and the like shall be used where shown on shop drawings, but elsewhere, #8 copper or stainless steel wire anchors shall be used. It shall be the responsibility of the Marble Contractor to anchor all marble securely. For standing marble, the following practices usually prevail:

A minimum of four anchors should be provided for pieces up to 12 square feet, with two additional anchors for each additional 8 square feet of surface area. Shims used to maintain joints shall be plastic. Use of copper wire for anchors to be installed over 12′ off the ground is not recommended.

3.0 FABRICATION

3.1 Dimensional Tolerances

Panel thickness of 3/8″ or 1/2″…….±1/32″
Panel thickness of 3/4″ to 1-5/8″ ….±1/8″
Panel thickness >1-5/8″…….±1/4″
Panel face dimension ……..±1/16″
Face variation from rectangular …….±1/16″
(maximum out of square) (noncumulative)
Heads/calibrated edges ……..±1/16″
Quirk miters (width of nose):
Up to 1/4″……-0; +25% of dim
Over 1/4″…….-0, +1/16″
Location of back anchors…….±1/8″
Depth of back anchors…….-0, +1/16″
Location of holes for precast anchors. ….. ±1/4″
Hole depth for precast anchors…….. ±1/16″
Anchor Slots:
From face to C/L of slot ….. ±1/16″
Lateral placement…….. ±1/4″
Width…….. ±1/16″
Depth at maximum…… ±1/8″
Anchor Holes:
From face to C/L of slot ….. ±1/16″

Lateral placement…….. ±1/8″
Diameter ……. ±1/16″
Depth ……. ±1/8″
Anchor Sinkages:
Depth…….-0, +1/8″
Continuous Kerfs:
From face to C/L of kerf….. ±1/16″
Maximum bow in 4′-0″……. ±1/16″
Width……. ±1/16″
Depth…….-1/16″; +1/8″
Rebated Kerf:
Elevation of bearing surface.. ±1/16″
Bearing Checks:
Elevation of bearing surface . ±1/16″
Bearing/Clearance Checks:
Lateral location ……. ±1/2″
Setback from face…….. ±1/16″

3.1.1 Typical Unit Sizes

Tile stock- 12” x 12”, 16” x 16”, & 18” x 18” nominal. Thickness of tile stock is typically 3/8”thick for most polished and honed surfaces. Large format tile stock (16” x 16” and larger) may only be available in 1/2” thickness and is dependant on the specific stone’s properties and the material supplier.
Dimension Stone Slab Stock- Industry standard slab stock available in 2 cm & 3 cm (3/4” & 1 1/4” nominal) thickness. Typical slab sizes vary by material, but average 4’-0 x 8’-0” for marble. For specialty thicknesses or extremely large piece size requirements, the Marble Contractor should be consulted in the design phase to assure the design intent can be met. Typical maximum finished piece size is 3’-0” x 3’-0” +/-.

3.2 Flatness Tolerances

Variation from true plane, or flat surfaces, shall be determined by a 4′ dimension in any direction on the surface. Such variations on polished, honed, and fine rubbed surfaces shall not exceed tolerances listed below, or 1/3 of the specified joint width, whichever is greater. On surfaces

having other finishes, the maximum variation from true plane shall not exceed the tolerance listed below, or 1/2 of the specified joint width, whichever is greater.

Flatness Tolerances by Finish.
Polished, honed, or fine rubbed……1/16″
Sawn, 4-cut, 6-cut, and 8-cut ……..1/8″
Thermal and coarse stippled …….3/16″
Pointed or other rough cut ……1″
Split face….dependent on piece size & stock

3.3 Beds and Joints

Bed and joint width shall be determined by analysis of anticipated building movements and designed to accommodate such movements without inducing undue stresses in the stone panels or joint filler materials. Expansion joints shall be designed and located to accommodate larger movements.

3.4 Backs Of Pieces

Backs of pieces shall be sawn or roughly dressed to approximately true planes. Back surfaces shall be free of any matter that may create staining.

3.5 Moldings, Washes, and Drips

Moldings, washes, and drips shall be constant in profile throughout their entire length, in strict conformity with details shown on approved shop drawings. The finish quality on these surfaces shall match the finish quality of the flat surfaces on the building.

3.6 Back-Checking and Fitting to Structure or Frame

The building design should incorporate stone installation requirements such as material thickness, setting space, and anchorage allowances. Maintain a minimum of 1 1/4” between stone backs and adjacent structure and allow for all components of the building structure (waterproofing, flashing, etc). (Note: many bolted connections will require more space than this; 2″ space may be more desirable. Large-scale details should illustrate and control these conditions and be distributed by the General Contractor to the affected trades.)

3.7 Cutting for Anchoring, Supporting, and Lifting Devices

Holes and linkages shall be cut in stones for all anchors, cramps, dowels, and other tieback and support devices per industry standard practice or approved shop drawings. However, additional anchor holes may be drilled at job site by Marble Contractor to facilitate alignment. No holes or linkages will be provided for Marble Contractor's handling devices unless arrangement for this service is made by the Marble Contractor with the Marble Fabricator. (NOTE: It is not recommended that Lewis pins be used for stones less than 3-1/2″ thick.)

3.8 Cutting and Drilling for Other Trades

Any miscellaneous cutting and drilling of stone necessary to accommodate other trades will be done by the Granite Fabricator only when necessary information is furnished in time to be shown on the shop drawings and details, and when work can be executed before fabrication. Cutting and fitting, due to job site conditions which are contrary to the dimensions and details shown on approved shop drawings are not the responsibility of the Marble Contractor and will be provided only by arrangement between the General Contractor and Marble Contractor.

3.9 Carving and Models

All carving shall be done by skilled Stone Carvers in a correct and artistic manner, in strict accordance with the spirit and intent of the approved shop drawing, or from models furnished or approved by the Specifying Authority.

4.0 SHIPPING AND HANDLING

4.1 Packing and Loading

Finished marble shall be carefully packed and loaded for shipment using all reasonable and customary precautions against damage in transit. No material which may cause staining or discoloration shall be used for blocking or packing.

4.2 Site Storage

It shall be the responsibility of the Marble Contractor to receive, store, and protect the marble from damage by others after it is delivered to the job site and prior to its erection in the building. All marble shall be received and unloaded at the site with care in handling to avoid damage or soiling. If marble is stored outside, it shall be covered with nonstaining waterproof paper, clean canvas, or polyethylene.

5.0 INSTALLATION

5.1 General Installation

Installation shall be accomplished with competent, experienced Stone Setters, in accordance with the approved shop drawings. All marble pieces shall be identified with a unique piece number corresponding with the number on the shop drawings. Interchanging of numbered pieces is not permitted as the pieces are generally blended for color and characteristic markings by the Marble Fabricator. Marble shall be free of any ice or frost at time of installation. Salt shall not be used for the purpose of melting ice, frost, or snow on the stone pieces. Adequate protection measures shall be taken to ensure that exposed surfaces of the stone shall be kept free of mortar at all times as elements in mortar may etch the polished surfaces of some stones. All setting materials shall be tested on the specified stone to assure there is no staining.

5.2 Mortar Setting of Marble

A. Floor Marble

Floor Preparation. It is the General Contractor's responsibility to clean all sub floor surfaces immediately prior to setting marble floor and to ensure that the area to receive the stone flooring meets the deflection standards of the industry.

Curing Compounds. Curing compounds of any kind shall not be used on the slab on which floor marble is to be directly set. If a curing compound is present, it is the General Contractor's responsibility to remove it by scarifying the slab. Before being set, all marble shall be clean and free of foreign matter of any kind.

Cement Bed. The cement bed to receive the marble tile shall consist of 1 part Portland Cement to not more than 3 to 5 parts of clean, sharp sand mixed quite dry for tamping. White Portland cement is recommended for light-colored marbles.

Marble Tamped. The marble shall be tamped with a suitable mallet until firmly bedded to the proper level of the floor.

Marble Removed. The marble shall then be removed and the back parged with wet cement or the bed sprinkled with water and cement. In the latter procedure, the back of the marble shall be wet. The method of fully buttering edges of the marble as it is laid is equally approved.

Joints. Joints between the marble pieces shall show an even width when laid and finished.

Traffic After Installation. The floor shall be roped off for 24 hours after installation and then

grouted with water and white Portland cement grout or nonstaining dry-set Portland cement grout.

Time-Line for Additional Cleaning.
Cleaning or additional surfacing, if required, shall not be undertaken until the new floor is at least seven days old.
Thin-Set Method. The thin-set method of installing marble tile employing the use of dry-set Portland cement mortars is recommended for thin marble tiles (nominal 3/8″ thick) where optimum setting space is not available. Sub floor shall be clean, smooth finished, and level. Stone dust must be washed off the back face of stone pavers prior to installation. Apply mortar with flat side of trowel over an area that can be covered with tile while mortar remains plastic. Key the mortar into the substrate with the flat side of the trowel. Comb with the notched side of the trowel in one direction. Firmly press stone tiles into the mortar and move them perpendicularly across the ridges, forward and back approximately 1/8″to ¼” to flatten the ridges and fill the valleys. Ensure a maximum mortar thickness of 3/32″ between stone tile and backing after stone tile has been tamped into place. Stone tile shall not be applied to skinned-over mortar. Alternatively, back butter the stone tiles to ensure 100% contact. In either method, ensure 100% contact on 3/8″ tile; not less than 80% contact on ¾” or thicker material, noting that all corners and edges of stone tiles must always be fully supported, and contact shall always be 100% in exterior and/or water-susceptible conditions.

B. Interior Veneer Marble

The marble shall be set by spotting with gypsum molding plaster or cement mortar and the use of concealed anchors secured in the wall backing. Special consideration may be required for penetrations to fire rated walls.

C. Marble Wall Tile

Individually set thin tile (nominal 3/8″ thick) on vertical surfaces exceeding 8′ is not recommended. Where thin marble tile is installed, nonstaining adhesives or dry-set mortars may be used as setting beds.

5.3 Mortar Joints

Mortar joints shall be raked out to a depth of ½” to ¾”. Apply pointing mortar in layers not exceeding 3/8″ and allow each layer to get hard to the touch before the next layer is

applied. Tool finished joints with a concave tool having a diameter approximately 1/8″ greater than the joint width. Care shall be taken to keep expansion joints free of mortar, which would compromise their function.

5.4 Anchorage

All marble shall be anchored or doweled in accordance with the approved shop drawings. To the furthest extent possible, all anchor preparations in the marble units shall be shop applied. All anchorage devices and anchor hole/slot fillers shall be in accordance with ASTM C1242-02. Care must be taken to ensure that any holes capable of retaining water are filled after use to prevent water collection and freezing.

5.5 Sealant Joints

Where so specified, joints requiring sealant shall be first filled with a closed-cell ethafoam rope backer rod. The backer rod shall be installed to a depth that provides optimum sealant profile after tooling per manufacturer recommendations.

If recommended by the Sealant Manufacturer,
primers shall be applied to the substrate surfaces according to the manufacturer's directions prior to application of the joint sealant. A test should be conducted to assure that the specified sealant will not stain the stone. Typically, Sample pieces of stone with kerf cuts applied to the sample face representing the typical joint size (1/4" x 1/4", 3/8" x 3/8", 1/2" x 1/2" etc.) are filled with the specified sealant and allowed to cure for 24 to 48 hours. Any potential staining should be apparent at this point. Fully cured sealant samples will be submitted to demonstrate no staining to stone by the specified sealant.

5.6 Expansion Joints

It is not the intent of this specification to make control or expansion-joint recommendations for a specific project. The Specifying Authority must specify control or expansion joints and show locations and details on drawings. Typically, expansion joints are required at 20'-0" intervals and should be determined by the design professional and the Marble Contractor.

5.7 Caulking

Where so specified, joints shall be pointed with the sealant(s) specified in Section 2.4, after first installing the specified backup material and applying a primer if required, all in strict accordance with the printed instructions of the Sealant Manufacturer. All sealants shall be

tooled to ensure
maximum adhesion to the contact surfaces.

5.8 Weep Tubes

Plastic or other weep tubes shall be placed in joints where moisture may accumulate within the wall, such as at base of cavity, continuous angles, flashing, etc., or as shown on architectural drawings.

5.9 Installation Tolerances

The quality of the stone installation relies greatly on the quality and accuracy of those trades preceding stone installation. After review and approval, shop drawings shall be distributed and coordinated by the General Contractor to all trades whose work abuts, or is integral with the stone installation.

6.0 CLEANING AND PROTECTION

6.1 Cleaning

All cleaning methods shall be tested on material samples prior to application to the stone installation to assure there are no adverse effects of the cleaning method or products to the stone surface. Marble shall be cleaned after installation and all pointing or caulking is complete. All dirt, excess mortar, weld splatter, stains, and other defacements shall be removed. All cleaning methods shall be in accordance with ASTM C1515-01.
Marble Contractor should be contacted before cleaners other than neutral detergents are used.

6.2 Protection of Finished Work

After the marble work is installed, it shall be the responsibility of the General Contractor to see that it is properly and adequately protected from damage or stains until all trades are finished. This responsibility includes the stone cleaning costs prior to the required final inspection.

The Marble Contractor will outline the needs for protection, in writing, to the General Contractor. For the protection of projecting members, corners, window stools, and saddles, wood guards using lumber that will not stain or deface with marble shall be supplied, installed, and maintained by the General Contractor. All nails used shall be galvanized or nonrusting. Damage to finished marble by other trades shall be repaired or replaced at the expense of the

General Contractor. Marble flooring shall be adequately protected by the General Contractor against traffic and other damage with nonstaining materials, without cost to the Marble Contractor. All marble work in progress shall be
protected at all times during construction by use of a strong, impervious film or fabric securely held in place as required.

End of Section

PART 1 – GENERAL

1.1 Related Work

1. Not applicable.

1.2 Samples

1. Submit duplicate 1 m square pieces of each type of carpet specified, duplicate 125 x 75 mm pieces for each color selected, 150 mm lengths of binder bars, in accordance with Section 01340.

1.3 Maintenance Data

1. Provide maintenance data for carpet maintenance for incorporation into Maintenance Manual specified in Section 01730.

1.4 Warranty

1. Carpet manufacturer lifetime warranties: wear, static protection, delamination, tuftbind failure, edge ravel and zippering and dimensional stability. Provide one full box of carpet tile of each colour to Owner.

PART 2 – MATERIALS

2.1 Modular Carpet (CT)

1. Fibre: 100% solution dyed nylon.
2. Construction: textured dense pattern loop
3. Standard Backing System: PVC modular – containing recycled content.
4. Pile Density: 5300 FHA minimum.
5. Gauge: 1/12; 47.2 rows/10 cm, minimum.
6. Stitches: 11.2 spi; 45.3 stitches/10 cm, minimum.
7. Flammability: Radiant Panel ASTM E648 – Class I
8. Protections: anti-microbial, anti-zippering, anti-static and stain protection
9. Modular Size: 610 x 610
10. Manufacturers: Mohawk Group Carpet Tile = Caliber Series - BT282

Size:	600mm x 600mm P with T3 Back
Colours:	By Architect
Acceptable Equal by:	Manufacturers: Tarkett Essentialist Collection Centura Carpet – Venture Carpets – Tapis – Motion Interface – Retrofit Collection

2.2 Binder Bars

1. As recommended by carpet manufacturer. Color to match carpet. Metal only and no plastic units.

2. Use binder bars at exposed carpet edges. Install binder bars at doorways centered under doors.

2.3 Adhesive

1. Full spread premium pressure sensitive adhesive as recommended by carpet manufacturer to suit carpet and subfloor conditions, and allow repositioning.

PART 3 - EXECUTION

3.1 Examination

1. New concrete must be fully cured and free of moisture. New concrete requires a curing period of approximately 90 days. Tests for moisture and alkalinity must be performed as detailed under moisture testing.

2. Work of others in areas where carpet is installed has been completed.

3.2 Preparation

1. Dust, dirt, debris, and noncompatible adhesive must be removed before installation begins. Surfaces must be smooth and level with all holes and cracks filled with latex based Portland cement patching compound.

3.3 Installation

1. Establish measurement and layout per manufacturer's recommendations. Follow manufacturer's pallet and box sequencing.

2. Install starting in the corner of one quadrant and in a pyramid fashion. Install by butting edges together evenly and do not compress modules compress modules. Fit carpet neatly around architectural, mechanical, electrical and furniture fitments.

3. Cut carpet modules at perimeters, floor electrical outlets, and door openings. Apply adhesive whenever modules are cut. Loop pile modules may require trimming or clipping of tufts.

4. Finish seams level, flat and inconspicuous.

3.4 Protection of Finished Work

1. Vacuum carpets clean. Protect traffic areas of carpeted floor with polyethylene drop sheets. Tape joints to prevent shifting.

2. After installation, and until project completion, coordinate work to ensure that carpeting is not damaged by traffic or by subsequent work.

End of Section

PART 1 - GENERAL

1.1 Related Work

1.	Shop painting miscellaneous metals	Section 05510
2.	Shop priming of ferrous doors and door frames	Section 08100
3.	Door Schedule	refer to drawings
4.	Room Finish Schedules	refer to drawings
5.	Colour code marking bands for identification of piping	refer to mechanical drawings

1.2 Reference Standard

1. Ontario Painting Contractors Association (OPCA) Architectural Specification Manual - referenced as OPCA Manual, latest Edition. Paint formulations and methods referred to herein refer to this Manual. If contractor is unfamiliar with this reference standard, contact the OPCA.

1.3 Environmental Requirements

1. Do not apply paint finish in areas where dust is being generated.

2. Conform to requirements of OPCA Manual.

3. Comply with the requirements of Section 01570-Environmental Health and Safety.

1.4 Finishes and Colours

1. Review the requirements outlined in Section 09010-Finish and Colour Notes. A separate colour schedule will be issued after contract award.

2. Allow for 6 colours total from all formulations for this project.

1.5 Extended Warranty:

1. Submit a warranty covering materials and labour and the repair or replacement of defective work for two (2) years total.

PART 2 - PRODUCTS

2.1 Materials

1. Acceptable products: Per Chapter 5 OPCA Manual and as listed.

2. Paint materials for each paint system to be products of a single manufacturer.

3. Use low-VOC and low-odour paints only.

PART 3 – EXECUTION

3.1 Preparation of Surfaces

1. Prepare surfaces to receive paint per Chapter 3 OPCA Manual.

3.2 Application

1. Sand and dust between each coat to remove defects visible from distance up to 1.5 m.

2. Finish closets and alcoves as specified for adjoining rooms.

3. Apply each coat at the proper consistency. Each coat of finish should be fully dry and hard before applying the next coat, unless the manufacturer's instructions state otherwise.

4. Apply concrete sealer to base of all crypt floors and extend up minimum 3 inches at all walls.

3.3 Mechanical and Electrical Equipment

1. Refer also to Finish Notes in Section 09010.

2. Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished areas as well as inside cupboards and cabinet work. Colour and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labeling after pipes have been painted. Do not paint white PVC covers on exposed mechanical water, drain and other lines

3. Paint gas piping standard yellow where visible on roof or in service spaces. Do not paint gas meter or gas equipment in wall niche yellow—colour to later selection by Architect.

4. Paint surfaces inside of ductwork and elsewhere behind grilles where visible using primer and one coat of matte black paint.

5. Paint both sides and edges of plywood backboards for equipment before installation.

6. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.4 Paint Systems

1. System references listed are based on Chapters 4A and 4B of OPCA Manual and are OPCA Premium Grade, unless noted otherwise.

3.5 Interior Finishes

1. Wood, where applicable:

    .1 Doors, miscellaneous trim: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
    .2 Casework and miscellaneous wood items:
        .1 Exterior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
        .2 Interior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade

2. Gypsum board: INT.4-B, Latex Eggshell Finish, Premium Grade.

3. Concrete Block: INT. 8-A, Latex Semi-Gloss Finish, Premium Grade;

4. Concrete Block: Alkyd Gloss Finish, Premium Grade - shown on Room Finish Schedule as P-GF (Paint - Gloss) finish.

5. Concrete Floors, refer to Specifications - Concrete Floor Hardeners and Sealers for liquid sealer.

6. Exposed Cast in Place Concrete ceilings: INT. 8-A, Latex Flat Finish, Premium Grade

7. Exposed Precast Concrete ceilings: INT. 8-A, Latex Flat Finish, Custom Grade

8. Miscellaneous metal:

    .1 Primed: INT. 12-A, Alkyd Semi-Gloss Finish, Premium Grade
    .2 Galvanized: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade

9. Galvanized metal: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade

3.6 Exterior Finishes

1. Wood: EXT. 1-A-Gloss, Premium Grade

2. Pavement markings: EXT. 7-A, Zone Marking Alkyd Finish, Premium Grade.

3. Miscellaneous metal:
    .1 Primed: EXT. 11-A-Gloss, Premium Grade
    .2 Galvanized: EXT. 12-A-Gloss, Premium Grade

4. Galvanized metal: EXT. 12-A-Gloss, Premium Grade.

5. Steel - high heat: EXT. 15-A

End of Section

PART 1 - GENERAL

1.1 Related Includes

1. Multi-component intumescent coating.

1.2 Related Work

1. Structural Steel Framing — Refer to Structural Drawings
2. Painting — Section 09900

1.3 References

1. CAN/ULC-S102-03: Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 System Description

1. Intumescent Coating: multi-component seamless intumescent coating system, consisting of a primer, intermediate, finish and tinted top coats, applied to sufficient thicknesses to achieve required fire resistance ratings and W/D factors.

1.5 Submittals

1. Submit Product Data sheets as specified in Section 01340.
2. Product Data: include information on physical properties, installation instructions, and general requirements for each intumescent material required.

1.6 Samples

1. Submit samples as specified in Section 01340.
2. Verification Samples: 300 x 300 mm size sample of each type of intumescent coating, applied to a rigid backing, in the colour and finish indicated.

1.7 Closeout Submittals

1. Submit closeout submittals as specified in Section 01720.
2. Operation and Maintenance Data: Include procedures for stain removal, repairing surface, and cleaning.

1.8 Quality Assurance

1. Application: person or firm experienced in the manufacture and application of intumescent coating systems, with 10 years documented experience.

2. Arrange for manufacturer's representative to be present at start of installation.

1.9 Regulatory Requirements

1. Conform to applicable fire and building codes for flame spread, fuel contributed and smoke development ratings in accordance with CAN/ULC-S102.

1.10 Delivery, Storage and Handling

1. Store Products in a dry, enclosed area protected from exposure to moisture.

2. Maintain temperatures between 16° C and 32° C.

1.11 Site Conditions

1. Do not install coating when ambient temperature is below 4° C or above 43° C.

2. Maintain this temperature range 7 days before, during and 48 hours after installation of wall coating.

3. Ensure adequate ventilation is maintained during and after coating material application. Comply with WHMIS requirements and manufacturer's instructions.

PART 2 - PRODUCTS

2.1 Manufacturers

1. Manufacturers of intumescent coatings having Products considered acceptable for use:
   .1 A/D Fire Protection Systems Inc.
   .2 Cafco Industries Inc.
   .3 FlameOFF Fire Barrier Paint – For Wood Applications (Refer to drawings for required locations at existing wood floor assembly. Install as per manufacturer requirements to achieve required fire rating noted on drawings)

2. Substitutions: Refer to Instructions to Bidders Section 00200 and Section 01030.

2.2 Materials

1. Primer: use only manufacturer approved primer. Adhesion and compatibility characteristics in accordance with ASTM D3359-90 Method A and /or ASTM D4541-95.

2. Intermediate Coat(s) – Interior Applications: A/D Firefilm III, thin-film intumescent fire-resistive coating system for structural steel.

3. Top Coat: Carbocrylic 3350 or Sanitile 155 acrylic paint, applied to a minimum dry film thickness of 2 to 4 mils. For Carbocrylic 2250 and Sanitile 155, use spray application only.

2.3 Mixing

1. Thoroughly mix ingredients in proper quantities needed for immediate use, in accordance with manufacturer's instructions.

2. Provide uniformity of mix and colouration.

3. Discard mixed material 45 minutes after initial mixing at an air temperature of 25° C.

PART 3 - EXECUTION

3.1 Examination

1. Verify that site conditions are ready to receive work.

2. Verify structural steel has been prepared using SSPC SP-6, Commercial Blast Cleaning method.

3. Beginning of installation means acceptance of site conditions.

3.2 Preparation

1. Clean substrate surface free of foreign matter.

2. Spray apply surface primer to a dry firm thickness of 0.02 mm. Conform to manufacturer's instructions. Allow to cure.

3. Use scaffolding or a scissor-lift to assist the application process. Mask the spray area as required to protect adjacent areas from over-spray. Materials recommended for masking include rip-proof thin plastic tarps, spray adhesive and duct tape. Protecting the work area from the elements of weather is an integral part of the application process.

4. Ambient air and steel temperatures should be not less than 10°C. Relative humidity in the work area of 40 to 60 per cent is recommended for optimum drying and recoat times. Enclosure, heat and/or moisture control may be required to maintain acceptable conditions. High humidity at the site will hinder drying and will extend recoat/topcoat time. Air movement and thinner coats will assist drying.

3.3 Application

1. Apply coatings in accordance with SSPC Steel Structures Painting Manual, Volume 2.

2. Spray apply intermediate coating to primed substrate in multiple coats, to a dry film thickness sufficient to achieve required fire resistance rating and W/D factor of steel member being protected, Refer to UL Directory or relevant fire test design information to determine the minimum dry film thickness required for the size and orientation of steel element to be protected and for the required fire resistance rating.. Allow each coat to cure prior to applying subsequent coats. A/D Firefilm III can be applied when the previous coat has a minimum Shore "D" hardness of 50, measured at 21°C.

3. Spray apply finish coating over cured intermediate coating to a minimum dry film thickness of 0.02 to 0.04 mm.

4. Frequent thickness measurements with a wet film gauge is recommended during the application process to ensure uniform thickness.

5. Terminate in straight lines, at masking tape line.

6. Cure Products in accordance with manufacturer's directions.

7. Prevent contamination during application and prior to completion of curing process. Close area of application for a minimum of 24 hours after application.

3.4 Field Quality Control

1. Field inspection will be performed by an independent inspector.

2. Inspect dry film thicknesses with a positector or similar dry film thickness testing device. Variance from specified thicknesses shall be in accordance with SSPC PA-2.

3.5 Protection

1. Protect intumescent coatings from damage and wear during construction with temporary covering.

2. Remove temporary covering and clean intumescent wall system prior to final inspection. Clean materials in accordance with manufacturer's guidelines.

End of Section

PART 1 - GENERAL

1.1 Shop Drawings

1. Submit shop drawings in accordance with Section 01340.

1.2 Glass-fronted Niches

1. Base bid by Biondan Modulare Niches – Biondan North America.
2. Sizes per drawings and layout.
3. Niche covers allow for 80% Glass Covered Shutters and 20% Bottocino Marbles.
4. Allow for up to 10 columns of curved niches, located at the ends of the niche areas 1,2,3,4,5.

End of Section