

PROJECT SPECIFICATIONS

ALTERATIONS to
**ST. THERESE CATHOLIC
ELEMENTARY SCHOOL**

530 KILLALY ST. EAST
PORT COLBORNE, ON

for



NIAGARA CATHOLIC
DISTRICT SCHOOL BOARD
427 Rice Road
WELLAND ON L3C 7C1

ISSUED FOR TENDER - APRIL 2024

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SPECIFICATION INDEX

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530 KILLALY ST. EAST, PORT COLBORNE ON

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NIAGARA CATHOLIC DISTRICT SCHOOL BOARD

ISSUED FOR TENDER: April 2024

WHITELINE ARCHITECTS INC. SPECIFICATIONS

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**Alterations at
ST. THERESE CATHOLIC ELEMENTARY SCHOOL**
530 Killaly St. East, Port Colborne ON
for the Niagara Catholic District School Board

Issued for Tender: April 2024

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The following supplementary conditions to the CCDC 2-2020 Stipulated Price Contract have been developed in consultation and agreement with the Ontario General Contractors Association (OGCA) and are in alignment with supplementary conditions that have been established previously in consultation with specific owner groups and industry partners. This document updates the previous supplementary conditions document which was jointly developed for use with CCDC 2-2008. Revisions to this document are indicated by a vertical bar in the right margin of the paragraph where the revision was made.

The OGCA has issued this same set of supplementary conditions to their members with the advice that they have been developed in consultation with the Ontario Association of Architects (OAA).

Recommended Supplementary Conditions for the Stipulated Price Contract – CCDC 2-2020

September 15, 2021 (Revised February 10, 2022)

The Standard Construction Document for CCDC 2 Stipulated Price Contract, 2020 English version, consisting of the Agreement Between *Owner* and *Contractor*, Definitions, and General Conditions of the Stipulated Price Contract, Parts 1 to 13 inclusive, governing same is hereby made part of these *Contract Documents*, with the following amendments, additions and modifications. Where these amendments, additions, and modifications specifically reference a change to the Agreement, Definitions, or General Conditions, these amendments, additions and modifications shall govern.

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

AMENDMENTS TO AGREEMENT

ARTICLE A-5 – PAYMENT

- .1 In paragraph 5.1.1 of Article A-5 add the following words to the end:
“or, where there is no *Payment Certifier*, jointly by the *Owner* and *Contractor*”

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

- .1 Delete paragraph 6.5 of Article A-6 in its entirety and replace it with the following:
“6.5 Contact information for a party may be changed by *Notice in Writing* to the other party setting out the new contact information in accordance with this Article.”

AMENDMENTS TO DEFINITIONS

- .1 Add the following definition: Proper Invoice
“*Proper Invoice* means a “proper invoice” as defined in the *Payment Legislation*, if any, and as may be modified by written agreement between the parties to the extent permitted by such *Payment Legislation*.”
- .2 Add the following definition: Submittals
“*Submittals* are documents or items required by the *Contract Documents* to be provided by the *Contractor* such as:
- *Shop Drawings*, samples, models, mock ups to indicate details or characteristics, before the portion of the *Work* that they represent can be incorporated into the *Work*, and
 - As-built drawings and manuals to provide instructions to the operation and maintenance of the *Work*.”

SUPPLEMENTARY CONDITIONS

PART 1 GENERAL PROVISIONS

GC 1.1 CONTRACT DOCUMENTS

- .1 Delete paragraphs 1.1.3 and 1.1.4 in their entirety and replace them with the following:
- “1.1.3 The *Contractor* shall review the *Contract Documents* for the purpose of facilitating and co-ordination and execution of the *Work* by the *Contractor*. The *Contractor* shall report promptly to the *Consultant* any ambiguities, design issues or other matters requiring clarification made known to the *Contractor* or that the *Contractor* may discover from such a review. Such review by the *Contractor* shall comply with the standard of care described in paragraph 3.9.1 of the *Contract*.
- 1.1.4 Except for its obligation to review the *Contract Documents* and report the result pursuant to paragraph 1.1.3, the *Contractor* is not responsible for ambiguities, design issues or other matters requiring clarification in the *Contract Documents* and does not assume any responsibility to the *Owner* or to the *Consultant* for the accuracy of the *Contract Documents*. Without limiting the foregoing, the *Contractor* shall not be liable for any damages or costs resulting from any ambiguities, design issues or other matters requiring clarification in the *Contract Documents* which the *Contractor* could not reasonably have discovered from such a review in accordance with the standard of care. If the *Contractor* does discover any ambiguities, design issues or other matters requiring clarification in the *Contract Documents*, the *Contractor* shall not proceed with the work affected until the *Contractor* has received modified or additional information from the *Consultant*. The impacts of any ambiguities, design issues or other matters requiring clarification in the *Contract Documents*, including to the *Contract Price* and *Contract Time*, shall be addressed by the parties in accordance with Part 6 – CHANGES.”
- .2 Add the following to the end of subparagraph 1.1.6.2:
“Except to the extent the *Consultant* is indemnified as a third party beneficiary as provided in subparagraphs 9.2.7.4 and 9.5.3.4 and in paragraph 13.1.3.”

PART 2 ADMINISTRATION OF THE CONTRACT

GC 2.2 ROLE OF THE CONSULTANT

- .1 In paragraph 2.2.3 add the following to the end:
“Without limiting the foregoing, the *Consultant* may appoint one or more authorized representatives in writing who may fulfill the obligations of the *Consultant* under this *Contract*.”
- .2 In paragraph 2.2.8 add the words “, written statements” after the word “interpretations” in both the first and second sentences; and
 - i. add the following to the end of paragraph 2.2.8:
“The *Owner* and the *Contractor* shall waive any claims against the *Consultant* arising out of its making of any interpretations, written statements or findings in accordance with paragraphs 2.2.6, 2.2.7, 2.2.8, and 7.1.2, but only to the extent that any such interpretations, written statements, and findings are made by the *Consultant* in an unbiased manner, and in accordance with the *Consultant’s* professional standard of care at law.”
- .3 In paragraph 2.2.13 add the words “which are provided” before the words “by the *Contractor*”.

GC 2.4 DEFECTIVE WORK

- .1 In paragraph 2.4.1:
 - i. Add after the words “shall promptly correct” the phrase “in a manner acceptable to the *Owner* and the *Consultant*”; and
 - ii. Add after the words “*Contract Documents*” the phrase “or work that the *Contractor* discovers to be defective, whether or not the defective work had been identified by the *Consultant*, and”.
- .2 Add new paragraph 2.4.4 as follows:
“2.4.4 The *Contractor* shall prioritize the correction of any defective work which, in the sole discretion of the *Owner*, adversely affects the day-to-day operation of the *Owner*.”

PART 3 EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

- .1 Add new paragraph 3.1.3 as follows:
“3.1.3 Prior to commencing individual procurement, fabrication and construction activities, the *Contractor* shall verify, at the *Place of the Work*, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or contradictions exist, or exact locations are not apparent, the *Contractor* shall immediately notify the *Consultant* in writing and obtain written instructions from the *Consultant* before proceeding with any part of the affected work.”

GC 3.2 CONSTRUCTION BY OWNER AND OTHER CONTRACTORS

- .1 Add new paragraph 3.2.7 as follows:

“3.2.7 At the commencement of the *Work*, the *Contractor* shall prepare for the review and acceptance of the *Owner* and the *Consultant*, a schedule indicating the times, within the construction schedule referred to in GC 3.4, that items that are specified to be *Owner* purchased and *Contractor* installed or hooked up are required at the site to avoid delaying the progress of the *Work*.”

GC 3.7 LABOUR AND PRODUCTS

- .1 Add the following to the end of paragraph 3.7.1:

“The *Contractor* represents that it has sufficient skilled employees to replace, subject to the *Owner’s* approval, acting reasonably, its designated supervisor and project manager in the event of death, incapacity, removal or resignation.”

- .2 Add new paragraphs 3.7.4 and 3.7.5 as follows:

“3.7.4 The *Owner* shall provide the *Contractor* in a timely manner with all relevant information (including storage, protection, and installation requirements) regarding *Products* to be supplied by the *Owner* or other contractors and, prior to delivery of any such *Products* to the *Place of the Work*, the *Owner* shall obtain the *Contractor’s* written approval of the delivery date and proposed storage, protection and installation requirements.

3.7.5 Once the *Contractor* has accepted delivery of *Products*, the *Contractor* shall be responsible for the safe storage and protection of *Products* as required to avoid dangerous conditions or contamination to the *Products* or other persons or property. *Products* shall be stored in locations and at the *Place of the Work* to the satisfaction of the *Owner* and the *Consultant* as agreed and approved by the *Contractor* pursuant to paragraph 3.7.4.

Notwithstanding the foregoing, the *Contractor* shall not be responsible for any *Products* supplied by the *Owner* or other contractors unless:

- (i) the *Contract Documents* expressly stipulate that such *Product* is to be the *Contractor’s* responsibility and to be installed by the *Contractor* as part of the *Work*;
- (ii) the *Contractor* has or has received from the *Owner* proof of insurance coverage sufficient, at a minimum, to cover the replacement cost of such *Product*; and
- (iii) the *Owner* obtained the *Contractor’s* approval as required by paragraph 3.7.4.”

GC 3.8 SHOP DRAWINGS

- .1 Add the words “AND OTHER SUBMITTALS” to the title of GC 3.8 after the words “SHOP DRAWINGS”.

- .2 Add the words “and *Submittals*” after the words “*Shop Drawings*” in paragraphs 3.8.1, 3.8.2, 3.8.3, 3.8.3.2, 3.8.5, 3.8.6, and 3.8.7.

- .3 Delete paragraph 3.8.2 in its entirety and replace it with new paragraph 3.8.2 as follows:

“3.8.2 Prior to the first application for payment, the *Contractor* and the *Consultant* shall jointly prepare a schedule of the dates for submission and return of *Shop Drawings* and *Submittals* in an orderly sequence.”

- .4 Delete the words “with reasonable promptness so as to cause no delay in the performance of the Work” and replace them with the words “within 10 *Working Days* or such longer period as may be reasonably required” in paragraph 3.8.7.

GC 3.9 PERFORMANCE BY CONTRACTOR

- .1 Add new General Condition GC 3.9 as follows:

“GC 3.9 PERFORMANCE BY CONTRACTOR

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

PART 4 ALLOWANCES

GC 4.1 CASH ALLOWANCES

- .1 Delete paragraph 4.1.7 in its entirety and replace it with the following:
 - “4.1.7 At the commencement of the *Work*, the *Contractor* shall prepare for the review and acceptance of the *Owner* and the *Consultant* a schedule indicating the times within the construction schedule referred to in GC 3.4 that items called for under cash allowances are required to be delivered to the *Place of the Work* to avoid delaying the progress of the *Work*.”
- .2 Add new paragraph 4.1.8 as follows:
 - “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.”

PART 5 PAYMENT

GC 5.4 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

- .1 Delete all paragraphs of GC 5.4 in their entirety and replace them with the following paragraphs:
 - “5.4.1 When the *Contractor* considers that the *Work* is substantially performed, or if permitted by the lien legislation applicable to the *Place of the Work* a designated portion thereof which the *Owner* agrees to accept separately is substantially performed, the *Contractor* shall, within five (5) *Working Days*, deliver to the *Consultant* and to the *Owner* a comprehensive list of items to be completed or corrected, together with a written application for a review by the *Consultant* to establish *Substantial Performance of the Work* or substantial performance of the designated portion of the *Work*. Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.

- 5.4.2 The *Consultant* will review the *Work* to certify or verify the validity of the application and shall promptly, and in any event, no later than 10 calendar days after receipt of the *Contractor's* application:
- .1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or
 - .2 state the date of *Substantial Performance of the Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.
- 5.4.3 Where the holdback amount required by the applicable lien legislation has not been placed in a separate lien holdback account, the *Owner* shall, no later than 10 calendar days prior to the expiry of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, place the holdback amount in a bank account in the joint names of the *Owner* and the *Contractor*.
- 5.4.4 Subject to the requirements of any *Payment Legislation*, all holdback amounts prescribed by the applicable lien legislation for the *Place of the Work* shall become due and payable to the *Contractor* no later than 10 *Working Days* following the expiration of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, as certified or verified by the *Consultant* when permitted by any *Payment Legislation*.
- 5.4.5 The *Contractor* shall submit an application for release of the lien holdback amount in accordance with the lien legislation applicable to the *Place of the Work*. Except to the extent required by any *Payment Legislation*, such application for release of the holdback shall not constitute an application for payment that is subject to *Proper Invoice* requirements.
- 5.4.6 Where legislation permits progressive release of the holdback for a portion of the *Work* and the *Consultant* has certified or verified that the part of the *Work* has been performed prior to *Substantial Performance of the Work*, the *Owner* hereby agrees to release, and shall release the holdback for such portion of the *Work* to the *Contractor* in accordance with such legislation.
- 5.4.7 Notwithstanding any progressive release of the holdback, the *Contractor* shall ensure that such parts of the *Work* are protected pending the issuance of a final certificate for payment or until the *Owner* takes early occupancy in accordance with GC12.2, whichever comes first, and shall be responsible for the correction of defects or work not performed regardless of whether or not such was apparent when the holdback was released.”

GC 5.5 FINAL PAYMENT

- .1 Add to the end of paragraph 5.5.1 the following sentence:
“The application for final payment shall meet the requirements of a *Proper Invoice*.”
- .2 Add the following to the end of paragraph 5.5.3:
“Subject to any *Payment Legislation*, when the *Consultant* finds the *Contractor's* application for final payment to be not valid, the *Contractor* shall revise and resubmit the application when the *Contractor* has addressed the reasons given by the *Consultant*.”

PART 6 CHANGES IN THE WORK

GC 6.3 CHANGE DIRECTIVE

- .1 Delete the word “and” from the end of subparagraph 6.3.7.18.
- .2 Delete the period from the end of subparagraph 6.3.7.19 and replace it with “; and”.
- .3 Add new subparagraph 6.3.7.20 as follows:
“.20 safety measures and requirements.”

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

- .1 Add new paragraph 6.4.5:
“6.4.5 The *Contractor* confirms that, prior to bidding the *Project*, it carefully reviewed the *Place of the Work* and applied to that review the degree of care and skill described in paragraph 3.9.1, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the *Contractor* prior to submission of bid, and the sufficiency and completeness of the information provided by the *Owner*. The *Contractor* is not entitled to compensation or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by the *Contractor* by such review undertaken in accordance with this paragraph 6.4.5.”

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

- .1 Add the words “as noted in paragraph 6.6.3” after the words “of the claim” in paragraph 6.6.5 and add the words “and the *Consultant*”, at the end of paragraph 6.6.5.

PART 8 DISPUTE RESOLUTION

GC 8.3 ADJUDICATION

- .1 Delete the word “prescribed” from paragraph 8.2.1 and substitute the words “provided for”.

GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

- .1 Add the following new paragraphs 8.3.9 to 8.3.13:
“8.3.9 Within five days of receipt of the notice of arbitration by the responding party under paragraph 8.3.6, the *Owner* and the *Contractor* shall give the *Consultant* a written notice containing:
 - .1 a copy of the notice of arbitration;
 - .2 a copy of supplementary conditions 8.3.9 to 8.3.14 of this *Contract*, and;
 - .3 any claims or issues which the *Contractor* or the *Owner*, as the case may be, wishes to raise in relation to the *Consultant* arising out of the issues in dispute in the arbitration.”

- 8.3.10 The *Owner* and the *Contractor* agree that the *Consultant* may elect, within ten days of receipt of the notice under paragraph 8.3.9, to become a full party to the arbitration under paragraph 8.3.6 if the *Consultant*:
- .1 has a vested or contingent financial interest in the outcome of the arbitration;
 - .2 gives the notice of election to the *Owner* and the *Contractor* before the arbitrator is appointed;
 - .3 agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.3.6, and,
 - .4 agrees to be bound by the arbitral award made in the arbitration.
- 8.3.11 Without limiting and subject to the *Owner* and *Contractor*'s rights under paragraph 8.3.12 to challenge whether the *Consultant* has satisfied the requirements of paragraph 8.3.10, if an election is made under paragraph 8.3.10:
- .1 the *Owner* or *Contractor* may request particulars and evidence of the *Consultant*'s vested or contingent financial interest in the outcome of the arbitration;
 - .2 the *Consultant* shall participate in the appointment of the arbitrator; and,
 - .3 notwithstanding the rules referred to in paragraph 8.3.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the respondent receives a copy of the notice of arbitration.
- 8.3.12 The arbitrator in the arbitration in which the *Consultant* has elected under paragraph 8.3.10 to become a full party may:
- .1 on application of the *Owner* or the *Contractor*, determine whether the *Consultant* has satisfied the requirements of paragraph 8.3.10, and;
 - .2 make any procedural order considered necessary to facilitate the addition of the *Consultant* as a party to the arbitration.
- 8.3.13 The provisions of paragraph 8.3.9 shall apply (with all appropriate changes being made) to written notice to be given by the *Consultant* to any sub-consultant."

PART 9 PROTECTION OF PERSONS AND PROPERTY

GC 9.1 PROTECTION OF WORK AND PROPERTY

- .1 Delete subparagraph 9.1.1.1 in its entirety and replace it with the following:
 - “.1 errors or omissions in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraph 3.9.1;”
- .2 Delete paragraph 9.1.2 in its entirety and replace it with the following:

“9.1.2 Before commencing any *Work*, the *Contractor* shall determine the locations of all underground utilities and structures indicated in the *Contract Documents*, or that are discoverable by applying to an inspection of the *Place of the Work* the degree of care and skill described in paragraph 3.9.1.”

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

- .1 Add the following words to paragraph 9.2.6 after the word "responsible":
"or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the *Owner* or others,"
- .2 Add the words "and the *Consultant*" after the word "*Contractor*" in subparagraph 9.2.7.4.
- .3 Add the following words to paragraph 9.2.8 after the word "responsible":
"or that any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the *Owner* or others,"

GC 9.5 MOULD

- .1 Add the words "and the *Consultant*" after the word "*Contractor*" in subparagraph 9.5.3.4.

PART 10 GOVERNING REGULATIONS

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

- .1 Delete from the first line of paragraph 10.2.5 the word, "The" and substitute the words "Subject to paragraph 3.9.1, the".

PART 12 OWNER TAKEOVER

GC 12.1 READY-FOR-TAKEOVER

- .1 After the second occurrence of the term "*Ready-for-Takeover*" insert before the term "*Ready-for-Takeover*" in paragraph 12.1.3 the words "determination of".

GC 12.2 EARLY OCCUPANCY BY THE OWNER

- .1 Delete the word "achieve" in paragraph 12.2.4 and replace it with the words "have achieved".

GC 12.3 WARRANTY

- .1 Delete the word "The" from the first line of paragraph 12.3.2 and replace it with the words "Subject to paragraph 3.9.1, the".

PART 13 INDEMNIFICATION AND WAIVER

GC 13.1 INDEMNIFICATION

- .1 Add new paragraph 13.1.0 as follows:
 - "13.1.0 The *Contractor* shall indemnify and hold harmless the *Consultant*, its agents and employees from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings by third parties that arise out of, or are attributable to the *Contractor's* performance of the *Contract*, provided such claims are:
 - .1 attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property, and
 - .2 caused by negligent acts or omissions of the *Contractor* or anyone for whose negligent acts or omissions the *Contractor* is liable, and
 - .3 made by *Notice in Writing* within a period of 6 years from the *Ready-for-Takeover* date or within such shorter such period as may be prescribed by any limitation statute or the Province or Territory of the *Place of Work*."
- .2 Add the words "13.1.0," after the word "paragraphs" in paragraph 13.1.3.

[End of recommended supplementary conditions]

The items outlined herein under Section 01005 shall comprise "PART 1/Division One" General Instructions/General Requirements for the project and apply to all subsequent Specification sections as if repeated therein.

1.1 General Description of Work

- .1 Work under this Contract generally includes (without strict limitation to) the items noted below:

Alterations to **St. Therese Catholic Elementary School, 530 Killaly St. East, Port Colborne, St. Catharines, ON** for the Niagara Catholic District School Board including:

- a) A new Entry Canopy
- b) Exterior Siding and soffit Replacement
- c) Window Replacement
- d) Renovation to the Reception & Administration Areas

The work shall be as outlined in all project drawings, specifications and supplementary reports (by outside Consultants) provided herein, all comprising the Tender Documents/Contract Documents.

1.2 Project Documents

- .1 Maintain at the job site, one copy each of following:

- a) Contract Drawings (architectural, engineering and all related consulting drawings)
- b) Specifications
- c) Addenda
- d) Reviewed shop drawings
- e) Change Orders, Contemplated Change Orders and Change Directives/Notices
- f) Site/Field Instructions
- g) Other modifications to contract
- h) Field test reports
- i) Copy of approved Construction Schedule
- j) Manufacturers' installation and application instructions.
- k) List of Sub-contractors
- l) Progress photographs
- m) Record Set of Drawings (being progressively updated)
- n) Minutes of Site Meetings

1.3 Specifications

- .1 Portions of Specifications are written in short form. Therefore, it shall be understood that where item of Work is stated in heading followed by material, equipment, component, or operation, words "shall be", "shall consist of" or similar words or phrases are implied which denote supply, fabricate and supply, install, provide or commission of such materials, equipment or operations for component of Work designated by heading.
- .2 Whenever used in Specifications following definitions shall apply:
 - a) SUPPLY - Procurement or fabrication of standard components not to special design of materials, equipment, or components, or performance of services to extent indicated. Where used with respect to materials, equipment, or components, term shall include delivery to Site but is not intended to include installation of item, either temporary or final.
 - b) FABRICATE AND SUPPLY - Fabrication of materials, equipment or component, to special customized design to extent indicated including delivery to Site, assisting in form of supervision to those Section(s) installing materials, equipment, or component. Term does not include installation of item either temporary or final.
 - c) INSTALL - Placement of materials, equipment, or components, including receiving, unloading, transporting, storage, uncrating and installing, and performance of such testing and finish work as is compatible with degree of installation specified complete ready for use.
 - d) PROVIDE - To Supply and Install, complete and in place, including accessories, finishes, tests and services as required to render item so specified complete ready for use.
 - e) COMMISSION - Startup and initial operation of equipment as required and/or as specified in respective Sections, to demonstrate satisfactory operation of components and entire system including calibration of any control instrumentation as required to maintain operations.
- .3 Drawings, Lists or Schedules of Items are intended to show scope and arrangement of work. For location of item described refer to such Drawings, Lists or Schedules unless location stipulated in Specifications.

- .4 Wherever words "acceptable", "approved", "reviewed", "satisfactory", "selected", "directed", "designated", "permitted", "inspected", "instructed", "clarification", "required", "report", "submit", "obtain", "consult", "advise", or similar words or phrases are used in Standards or in Contract Documents, it shall be understood that, unless context provides otherwise words "by/to/with/from the Architect shall follow them as applicable.
- .5 'Related Work', 'Related Divisions', 'Related Sections' etc.: Specifications sections provided herein may note and/or itemize specific sections or divisions of related work. This information if provided for general reference only. In all circumstances, the actual scope of related work is to be as shown/required by the full scope of work outlined in all of the Contract Documents (including the drawings) and in *no way* is to be limited to any information, provided, not provided and/or referenced only in the Specification documents.
- 1.4 Construction Schedule
- .1 Provide within 14 working days after Contract award, a Schedule showing anticipated progress stages and final completion of work within time periods and phases stated in the Tender Form.
- .2 In accordance with the established project schedule, provide a detailed Construction Schedule showing dates for:
- a) Submission of material sample submittals (along with an itemized list of samples to be submitted)
 - b) Submission of shop drawings (along with an itemized list of shop drawings to be submitted)
 - c) Supply and installation of [without strict limitation to]:
 - a. Architectural Millwork
 - b. Steel Doors and Frames
 - c. Finish Hardware
 - d. Barrier Free Door Operators
 - e. Glass and Glazing
 - f. Flooring/Floor Finishes
 - g. Mechanical Section
 - h. Electrical Section
- .3 Interim reviews of actual progress related to the Construction Schedule prepared by the Contractor will be conducted as by the Architect. Progressive updating and distribution of the Schedule (in conjunction with the input of the Architect and building Owner) will be the responsibility of the Contractor throughout the duration of the project.

- 1.5 Contractor's Use of Site
- .1 Contractor's use of site is limited to those areas of the site designated by the Owner and/or the Architect (as applicable). Operators' activities should allow for the ongoing needs of parking, deliveries, exits, fire safety access etc. on site throughout the course of construction.
 - .2 Do not unreasonably encumber ongoing use or access of site with materials or equipment. Stage, receive and store construction materials on site only as and where permitted by Owner or as directed by the Architect.
 - .3 Obtain and pay for use of additional storage facilities or work areas as needed throughout the course of construction.
- 1.6 Partial Occupancy of Use
- .1 Contractor to coordinate the Work with the continuing use of the remainder site.
- 1.7 Standards
- .1 Where reference is made to specification standards produced or enforced by various organizations, conform to most current edition of standards specified or, if not specified, to latest edition as amended and revised to date of Contract.
 - .2 If requested provide copy on Site of such standard(s).
 - .3 Where standard designated authorities such as "Engineer", Designer", "Purchaser" or some other such designation, these designations shall be taken to mean "Architect".
- 1.8 Building Codes
- .1 Comply with most recent and applicable versions of: The Building Code Act, as amended; the Ontario Building Code, as amended; Regulations and By-Laws of other authorities having jurisdiction including latest amendments thereto, all hereafter referred to as 'Code'. Where Code or Contract Documents do not cover a particular requirement which is covered by National Building Code, conform to requirements of NBC including its related supplements. Where Drawings and/or Specifications exceed Code requirements, satisfy such additional requirements.
 - .2 Where material is designated in Contract Documents for certain applications, unless otherwise specified, that material shall conform to minimum standards designated in appropriate divisions of the Code. In the absence of more restrictive requirements, comply with Division B Part 3 of the Ontario Building Code as a minimum standard. Similarly, unless otherwise specified and/or not required otherwise by Code, minimum installation methods and standards of workmanship shall conform to standards of Part 9 in the Ontario Building Code.

- 1.9 Project Meetings
- .1 Hold and chair project meetings at times, locations and frequencies requested by the Architect, but generally occurring at least once every two weeks.
 - .2 Notify all parties concerned (identified at the project outset by the Architect and Owner) of meeting times and dates.
 - .3 Record Minutes of meetings, and distribute to all parties within **three** calendar days after meetings.
- 1.10 Setting Out of Work
- .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
 - .2 Provide devices needed to lay out and construct work.
 - .3 Supply such devices as ladders, measuring tapes, straight edges and templates required to facilitate Architect's inspection of work.
 - .4 Supply stakes and other survey markers required for laying out work.
 - .5 Any deviation from line and level shall be corrected without additional cost, to the Architect's satisfaction.
- 1.11 Location of Equipment and Fixtures
- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate. Do not scale drawing for locating of position. Obtain Architect's direction.
 - .2 Locate equipment, fixtures, and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access, and maintenance.
 - .3 Inform Architect of impending installation and obtain his approval for actual location.
 - .4 Submit field drawings to indicate relative position of various services and equipment when required by Architect.
- 1.12 Concealment
- .1 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

**1.13 Cutting, Fitting,
Patching**

- .1 Execute cutting including excavation, fitting, and patching required to make work fit properly together.
- .2 Obtain Engineer's approval before cutting, boring or sleeving load-bearing members.
- .3 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .4 Fit work airtight to pipes, sleeves, ducts, and conduits.
- .5 Cutting and patching to be by tradesmen qualified in the respective sections of the work.

1.14 Existing Services

- .1 Before commencing Work, establish location and extent of existing services in area of Work and notify Architect.
- .2 Whenever it is necessary to cut, interfere with, or connect to existing services or facility do so at hours and times recommended by governing authorities and approved by Architect; and with minimum disturbance to occupants, pedestrian and vehicular traffic and public and private property.
- .3 Submit schedule to and obtain approval from Architect for each proposed shut-down of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 If unknown services are encountered, immediately notify Architect and confirm findings in writing and/or on Drawings. Obtain Architect's written direction if such services require cutting, capping or relocation to do Work.
- .5 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Architect.
- .6 Protect and record locations of maintained or rerouted service lines. Record locations of abandoned service lines.

1.15 Additional Drawings

- .1 Architect may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only. Such drawings shall have same meaning and intent as if they were included with plans referred to in Contract Documents.

**1.16 Relics and
Antiquities**

- .1 Relics and antiquities and items of historical or scientific interest such as cornerstones and contents commemorative plaques, inscribed tablets, and similar objects found on site or in buildings to be demolished, shall remain property of Owner. Protect such articles and request directives from Architect.

- 1.17 Coordination**
- .1 The Contractor will coordinate the work of all sub-contractors, including mechanical and electrical trades.
 - .2 Coordinate work of each Section as required for satisfactory and expeditious completion of Work. Take field dimensions as required. Take into account existing installations to assure best arrangements of components in available space. Consult before commencing Work in critical locations. Fabricate and erect Work to suit field dimensions and field conditions.
 - .3 Provide forms, templates, anchors, sleeves, inserts and accessories or other components required to be fixed to or inserted in the Work. As applicable set them in place or instruct related Sections as to their location.
 - .4 Pay cost of extra work caused by, and make up time lost as result of failure to comply with these requirements within established project timelines.
 - .5 Cutting and patching as specified in sub-section above.
- 1.18 Modular Coordination**
- .1 Where work incorporates metric modular components, the following rules apply:
 - a) Actual opening dimensions in masonry including doors, windows, walls, louvres and actual room sizes are 10 mm (3/8") greater than nominal dimensions given on Drawings. Actual thicknesses of walls, piers and overall lengths of walls or buildings are 10 mm (3/8") less than nominal dimensions given on Drawings unless indicated otherwise.
 - b) Unless indicated otherwise Drawing details at scales of 1:10 and less indicate "actual" rather than "nominal" dimensions.
- 1.19 Examination**
- .1 Examine work upon which your work depends. Report in writing defects in such work. Application of your work shall be deemed acceptance of work upon which your work depends.
 - .2 Drawings are, in part, diagrammatic and are intended to convey scope of Work and indicate general and approximate location, arrangement and sizes of fixtures, equipment, ducts, piping, conduit and outlets and similar items. Obtain more accurate information about locations, arrangement and sizes from study and coordination of Drawings, including shop drawings and manufacturers' literature and become familiar with conditions and spaces affecting these matters before proceeding with Work.

- .3 Where job conditions require reasonable changes in indicated locations and arrangements, make such changes with approval of Architect at no additional cost to Client. Similarly, where existing conditions interfere with new installation and require relocation, such relocation is included in Work.
 - .4 Install and arrange fixtures, equipment, ducts, piping and conduit to conserve as much headroom and space as possible, and avoid interference and obstruction of access. Observe good installation practice for safety, access, maintenance and follow manufacturer's recommendations. Make changes requested to comply with these requirements at no additional cost to Client.
 - .5 If requested by Architect, and before installation, relocate equipment, services, doors, openings, furring and other work at no additional cost to Client; providing such relocation involves only reasonable minor adjustments and reasonable advance notice is given in writing.
- 1.20 Cold Weather Work
- .1 Continue Work including winter months, if applicable, until Work is completed and accepted. Provide winter heat to maintain project timelines and to ensure completion (and Occupancy) by the date specified Tender Documents. No additional costs for cold weather heating will be entertained.
- 1.21 Materials, Plant and Equipment
- .1 Materials, plant and equipment specified shall form basis of Bid and Contract. Where more than 1 brand or manufacturer is named in Specifications, or on Drawings, choice is Bidders/Contractors provided requirements of Drawings and Specifications are met.
 - .2 Unless explicit statement is made in Bid/Contract Documents to say no substitutions will be permitted; then works "or approved alternate" are hereby deemed to apply to material, plant and equipment specified by brand or manufacturer, subject to following conditions:
 - a) Request for substitution is made after Contract award and in accordance with provisions for substitutions set out in the General Conditions of the Contract.
 - b) Proposed substitution satisfies all other indicated or specified requirements and conditions.
 - .3 Materials, plant and equipment shall not be damaged or defective and shall be of quality compatible with Specifications for purpose intended. If requested provide evidence as to type, source and quality. Remove and replace defective products, at own expense, regardless of previous inspections, and be responsible for delays and expenses caused thereby.

- .4 Replace factory finished equipment, or parts thereof, whose paint finish is damaged and cannot be reasonably remedied by paint touch-up.
- 1.22 **Material Storage and Handling**

 - .1 Store packaged materials in original, undamaged containers with manufacturer's labels and seals intact. Handle and store materials in accordance with manufacturer's and suppliers' recommendations and in manner to prevent damage to materials during storage and handling.
- 1.23 **Concealment of Work**

 - .1 Conceal pipes, ducts conduits, tubing, wiring and other items requiring concealment in floor, wall and ceiling construction of finished areas except where indicated or specified otherwise. If in doubt as to method of concealment, or intention of Contract Documents in this connection, request clarification from Architect before proceeding with work in question.
 - .2 Lay out mechanical and electrical work in advance of concrete placement and furring installation to allow for its proper concealment.
 - .3 Test and inspect work before applying pipe covering and before Work is concealed.
- 1.24 **Lines, Levels and Dimensions**

 - .1 Have registered Ontario Land Surveyor establish 1 permanent benchmarks on Site, referenced to established benchmarks by survey control points. Provide and maintain control lines and level required.
 - .2 Lay out work in accordance with lines, levels and dimensions indicated and/or provided on benchmarks established by survey.
 - .3 Verify lines, levels and dimensions. Report errors or inconsistencies in Drawings and obtain direction from Architect before commencing Work and prior to ordering of associated products and materials.
 - .4 Except as provided by survey, provide lines, levels dimensions necessary to relate work to that of other Sections.
- 1.25 **General Workmanship**

 - .1 Complete Work in accordance with industry standards for related type of work unless Contract Documents stipulate more precise requirements.
 - .2 Complete all Work in neat and careful manner to retain Work plumb, square and straight.
 - .3 Ensure Work is properly related to form close joints and appropriately aligned junctions, edges and surfaces and is free of warp, twist, wind, wave or other irregularities.

- .4 When required by Specifications or by manufacturer's recommendations, have manufacturer, supplier or accredited agent, inspect work which incorporates their products.
- .5 Do not permit materials to come in contact with other materials or environmental conditions which may result in corrosion, staining, discolouration, degradation or any adverse impact on completed Work. Provide compatible, durable separators where such contact is unavoidable.

1.26 Fasteners

- .1 Supply appropriate fasteners, anchors, accessories, and adhesives required for fabrication and erection of Work.
- .2 Unless specified otherwise use exposed metal fasteners and accessories of same texture, colour and finish as product being fastened.
- .3 Use metal fasteners of same material as metal component being fastened, or of metal which will not generate electrolytic action and cause damage to fastener or metal component under moist conditions. In general use noncorrosive or hot dip galvanized steel anchors occurring on or in exterior wall, slab, or other exterior locations, unless higher standard is indicated or specified.
- .4 Fastening devices or adhesives shall be of appropriate type, used in sufficient quantity and in such manner to provide positive, permanent fastening which will not shift, work loose or fail during occupancy of building due to vibration or other causes resulting from normal use of building. Install anchors at spacing to provide required load/stress carrying capacity. Do not use wood plugs.
- .5 Lay out fasteners neatly, evenly spaced and aligned. Keep exposed fasteners to minimum.
- .6 Supply adequate instructions and templates and, if necessary, supervise installation, where fasteners or accessories for your Section are required to be built into work of other Sections.
- .7 Do not use fasteners which will cause spalling, cracking, or deformation or deterioration of material being fastened by or to.
- .8 Do not use powder actuated fastening devices, which are used in tension, without approval. Take stringent safety precautions when using powder actuated fasteners. Use only low velocity plunger-type devices.
- .9 Use adhesives specified, or if not specified, those recommended by manufacturer of materials involved, compatible with materials to be joined, and effective in forming permanent joint of adequate strength.

- .10 Use screws, nails, staples, and other similar, driven fasteners suitable to materials to be joined and to conditions under which they are installed and used. Ensure that in finished work, fasteners are sized to take durable hold under stress to be encountered without damage to, or weakening of, elements secured together, and that fastenings will not corrode or cause staining of exposed surfaces.
 - .11 Do brazing or soldering to form durable connections of strength adequate to resist stresses to be encountered without deformation of elements joined. Prepare base metals and use methods and materials to ensure clean joint, and to prevent staining, corrosion, discolouration, deformation or other damage to finished Work.
 - .12 Do welding to CSA W59-M89 (for steel) or CSA W59.2-M91 (for aluminum) for material and methods, unless specified otherwise. Have welding performed by industry certified operatives to CSA W47.1-83 or CSA W47.2-M87.
- 1.27 Accessories**
- .1 Provide accessory items or materials required, such as brackets, cleats, connectors, sealants, lubricants, cleaners, protection, and similar items, whether specified or not, so that Work is complete and will perform as required.
- 1.28 Design and Safety Requirements for Temporary Work**
- .1 Be responsible for design, erection, operation, maintenance and removal of temporary structural and other temporary facilities. Engage and pay for registered Professional Engineering personnel skilled in appropriate disciplines to perform these functions where required by law or by the Contract Documents; and in cases where such temporary facilities and their method of construction are of such nature that Professional Engineering skill is required to produce safe and satisfactory results.
- 1.29 Protection and Safety**
- .1 Comply with requirements of Acts and Regulations with respect to health and safety including Occupational Health and Safety Act, as amended, and Workplace Hazardous Materials Information System (WHIMIS) Regulation, including following:
 - a) Before commencement of Work, and throughout Contract, maintain on Site, and readily accessible to all those who may be exposed to hazardous materials, list of hazardous materials proposed for use on Site or Workplace together with current Materials Safety Data Sheet (MSDS).
 - b) Ensure hazardous materials used and/or supplied on Site are labelled in accordance with WHIMIS requirements.

- c) Know and be aware of the procedures for safe handling, storage and use of such hazardous materials including special precautions, safe clean-up, and disposal procedures. Conform to Environmental Protection Act for disposal requirements.
 - d) ensure that those who handle, and/or are exposed to, or are likely to handle or be exposed to, hazardous materials are fully instructed and trained in accordance with WHIMIS requirements.
-
- .2 Protect excavation, trenches and building from damage from rainwater, ground water, backing up of drains or sewers and other water, frost, and other weather conditions. Provide sheeting, piling, shoring, pumps, equipment, temporary drainage, protective covering, and enclosures. Provide necessary pumps including spare pump for keeping project free of water throughout construction period.
 - .3 Protect, relocate and maintain existing, active services wherever they are encountered. Wherever inactive services are encountered, cap them off and remove unwanted portion, with approval of authorities having jurisdiction or public utility concerned in manner approved by them.
 - .4 Load no part of structure during construction with load greater than it is calculated to bear safely when completed. Make every temporary support as strong as permanent support. Place no load on concrete structure until it has sufficient strength to safely carry such load.
 - .5 Adequately protect floors and roofs from damage. Take special measures when moving heavy loads or equipment on them.
 - .6 Keep floors free of oils, grease or related contaminants likely to dis-colour them or adversely affect bond of applied surfaces including fumes generated by temporary heating devices. Take care not to spill or allow oil, grease, gasoline, diesel and fuel oil, chemicals and other substances to contaminate soil or water on or adjacent to Site. Should such contamination accidentally occur report it immediately and clean up to satisfaction of Architect.
 - .7 Protect work of other Sections from damage resulting from your work.
 - .8 Damaged work shall be made good wherever possible by Section whose work is damaged but at expense of those causing damage.

- .9 Protect glass and other finishes against heat, slag and weld splatter using suitable protective shields or covers.
 - .10 Prior to beginning of construction, design fire safety plan in conjunction with local Fire Chief. Post fire plan throughout construction and recommended. Do not allow accumulation of waste that may constitute fire hazard.
 - .11 Conform to Construction Safety Association of Ontario's manual on Propane in construction. Watch work area for minimum of 30 minutes after hot work is completed. Provide Site fire security when required by local building department and/or municipal fire department. Ensure that water supply is adequate for firefighting.
 - .12 Provide and maintain in working order, suitable Underwriters' labelled fire extinguishers and locate in suitable positions, to approval of authorities having jurisdiction.
 - .13 Provide minimum of 3 safety helmets for Architect and any other authorized visitors to Site if required.
 - .14 Protect public and those employed on Work from injury. Equipment (mobile) when not in use shall have keys removed and locked up in secure location.
- 1.30 Scaffolding**
- .1 Erect scaffolding independent of walls. Use it in manner as to interfere as little as possible with other Sections. When not in use, move it as necessary to permit installation of other work. Construct and maintain scaffolding in rigid, secure and safe manner. Remove it promptly when no longer required.
- 1.31 Temporary Cleaning**
- .1 Keep Site and building, including concealed spaces, free from accumulation of dirt, debris, garbage, and excess material. Remove oily rags and waste from premises at close of each day, or more often if required.
- 1.32 Manufacturers Directions**
- .1 Except where specified otherwise, use each product in accordance with manufacturer's published or written instructions, specifications or recommendations regarding handling, storage, preparation, Site conditions, ancillary products or accessories, methods of installation, protection and cleaning. Submit copy of such instructions and indicate if and where there is discrepancy between them and requirements of Specifications and obtain direction.

1.33 Spare Products

- .1 Where specified in other Sections, provide spare materials and products for future repair and replacement.
- .2 Ensure such materials are of same production run as those incorporated in Work.
- .3 Deliver quantities required, in separate labelled containers, and store where directed.
- .4 Labels shall state material description, colour, pattern and location of installation.

1.34 Environmental Practices

- .1 Take active role in implementing environmentally sound business practices and producing goods and services that lessen burden on environment in production, use and final disposition. Support implementation of reduction, reuse and recycling strategies and use of environmentally sound products. Reduce or eliminate excessive packaging and promote use of environmentally responsible packaging practices.
 - a) Environmentally Sound Products: Product that is made, used and disposed of in a manner that significantly reduces harm it would otherwise cause the environment. Product may be certified as environmentally sound because it is made in a way that improves energy efficiency, reduces hazardous by-products, uses recycled material, or because the product itself can be recycled or reused, or in some way is environmentally benign.
 - b) Packaging requirements: Implement waste reduction by reducing or eliminating excessive packaging practices.
 - c) Use, where appropriate, combination of packaging materials such as re-usable containers, blanket wrap or cushioning material provided that all reasonable requirements of materials handling, transportation and storage are observed.
 - d) Packaging materials such as kraft paper and corrugated cartons shall be made from reclaimed products to facilitate recycling of secondary materials.
 - e) Packaging material shall be clearly labelled to display their recycled content and recyclability.
 - f) Ensure that packaging materials are removed from Site and disposed of in environmentally responsible manner.

1.35 Waste Disposal

- .1 All refuse generated by and/or related to construction shall be removed from the project site and disposed of by the Contractor at an approved sanitary landfill site, recycling depot or waste collection facility suited to the nature of items being removed. All costs related to on-site handling of debris (including rental of on-site waste handling bins, dumpsters etc.) and the subsequent shipping and drop-off of waste is the sole responsibility of the Contractor throughout the duration of the project.
- .2 Coordinate all waste handling procedures within occupied buildings with Building Owners.
- .3 Coordinate all site locations of waste handling dumpsters with Building Owners.

1.36 Polychlorinated Biphenyl (PCB's)

- .1 In event of unexpected discovery of PCB's immediately notify Architect orally and in writing and do not handle, disturb or remove items containing PCB's. The Architect will authorize remedial work, if any, in writing. Do such remedial work as addition to Contract.

1.37 Spill Response Procedures

- .1 The Contractor shall have written spill response procedures and material on-site to respond to pollutants and contaminants into the natural environment in excess of levels permitted in regulations or cause or are likely to cause an adverse effect.

END OF SECTION 01005

- 1.1 Allowance Overview .1 Expend Cash Allowances only as directed and authorized by the Architect, and confirmed in writing. Supply detailed and itemized costs for all Allowances in writing for the Architect's approval prior to proceeding with work.
- .2 Unexpended amount(s) of cash allowances may be relocated to other specified cash allowances at the sole discretion of the Architect.
- .3 Unexpended amount(s) of cash allowances shall be deducted from the Contract Price at completion of the work.
- .4 Overhead and Profit for the General Contingency (Carried by General Contractor) will be as set out in Section 00710.
- .5 Do not include overhead and profit for work to be done under Cash Allowance Items noted below.

Overhead and Profit on cash allowances only applies when the cash allowance expenditure exceeds the sum stated for the particular allowance.

Then the overhead and profit on the excess amount will be allowed for the allowance in question as set out in Section 00710.
- .6 General Contingency and all cash allowances do not include H.S.T. It is understood that 13% is to be added to the General Contingency and Cash Allowances.

1.2 Contingency

The following General Contingency Fund/Allowance will be carried by the General Contractor and is to be included in the Total Contract Price submitted by the General Contractor in the Form of Tender.

- .1 **GENERAL CONTINGENCY FUND/ALLOWANCE:**
This Allowance includes for the supply and installation of additional items and/or services [related to the scope of work] as requested by the Client during the course of construction.

Include the sum of\$50,000.00

1.3 Cash Allowances

The following Cash Allowances value are to be carried by the General Contractor and is to be included in the Total Contract Price submitted by the General Contractor in the Form of Tender.

.1 CASH ALLOWANCES

This Allowance includes for the supply and installation of additional items and/or services [related to the scope of work and to the categories noted below] as requested/approved by the Client during the course of construction.

a) INSPECTION AND TESTING SERVICES:
(Allowance by General Contractor)

For Testing and/or Inspection services to be determined at a later date throughout the course of construction. This Allowance is to include all services related to inspection and/or testing of building materials, compaction, systems, concrete slab moisture testing and components, including travel to and from site, laboratory testing, technological services and all other costs incidental to this work. The testing and inspection work will be segregated into appropriate segments as per the Boards direction in coordination with the Architect.

Include the sum of\$10,000.00

b) ADDITIONAL HAZARDOUS MATERIALS ABATEMENT
(Allowance by General Contractor)

For the remediation of any hazardous materials over and above the specified work noted within the Tender Documents

Include the sum of\$10,000.00

c) ADDITIONAL ROOFING
(Allowance by General Contractor)

For any roofing work over and above the specified work noted within the Tender Documents.

Include the sum of\$10,000.00

d) LANDSCAPING
(Allowance by General Contractor)

For landscape beds, mulch, plantings, benches, steppingstones, etc.

Include the sum of\$15,000.00

**TOTAL CASH ALLOWANCE VALUE FOR ALL ITEMS NOTED ABOVE:
(to be included in Price listed in the 'Form of Tender'
document issued by NCDSB) \$45,000.00**

END OF SECTION 01020

1.1 Sample Submissions

- .1 Submit samples in sizes and quantities noted in Specifications and/or as requested by the Architect throughout the course of construction.
- .2 Where a variety of colours, patterns, textures or finish options are provided by product manufacturers (for items not previously specified by the Architect), submit the manufacturer's full range of samples/options to the Architect.
- .3 All samples of colours, materials and/or finishes are to be submitted to the Architect as actual material samples in hardcopy submission. NO virtual/electronic colour cards viewed on-line (i.e. from supplier or manufacturer websites), electronic photos etc. will be accepted as compliant submission formats.
- .4 All samples are to be submitted, forwarded and delivered to the Architect's office. It shall not be the responsibility of the Architect to pick up or order any required samples (from product suppliers) under any circumstances.
- .5 All samples shall be submitted to the Architect at least 21 days prior to product ordering. The Architect reserves the right to allow 7 days min. for sample submittal review.

Any item or samples not submitted in sufficient time for Architectural review and approval [relative to subsequent ordering, production and delivery of product to site when required] shall be the sole responsibility of the Contractor to rectify and make good to the satisfaction of the Architect. *Neither the Owner [nor the Architect and related consultants] shall be financially responsible for any additional costs associated with express shipping options, accelerated production premiums and/or substitute materials which are necessary due to delays by the Contractor [his Sub-Trades and/or related product suppliers] in submitting and receiving the necessary approvals.*

1.2 Co-ordination of Shop Drawings

- .1 Prior to first draw for payment being processed, the complete list of all shop drawings for the project shall be submitted and approved by all Consultants. Updated shop drawing schedule to be submitted with each draw until all shop drawings have been processed.

The Contractor shall formulate all Shop Drawing submission dates into the Project Construction Schedule only after verifying and allowing for sufficient product delivery times (product lead times) required to meet the Owner's schedule for completion of individual project phases.

- .2 Review shop drawings, product data and of samples prior to submission to ensure their conformance to project requirements.
- .3 Prior to the submission of Shop Drawings, verify and reflect in the shop drawings all related:
 - (a) Field measurements (taken from project job site)
 - (b) Field Construction Criteria (taken from project job site)
 - (c) Product requirements, complete with proper identification of related manufacturer's catalogue, model and/or product numbers
- .4 Co-ordinate each submission with requirements of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.
- .5 Contractor's responsibility for errors and omissions in submission is not relieved by Architect's review of submittals.
- .6 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.
- .7 Notify Architect, in writing at time of submission, of deviation from requirements of Contract documents.
- .8 After Architect's review, distribute copies.
- .9 All shop drawings shall be submitted to the Architect *at least 45 days prior to product ordering. This submission timeline in all circumstances shall be increased to allow for all required production and lead times relative to delivery of the product when required on site (identified within the Contractor's Construction Schedule).*

The Contractor must allow (within his Submission Schedule) for the possibility that all initial Shop Drawing submissions may not be approved, and that additional time is required for their subsequent revision and resubmission.

All shop drawings identified for re-submission are to be rectified and returned to the Architect's office within 7 days after previous review date on the Shop Drawings.

Any delays in the re-submission of rectified or approvable shop drawings are the sole responsibility of the Contractor, along with any and all related expenses to accelerate product production, shipping and delivery and (where necessary) substitution to an alternate product deemed acceptable by the Architect.

1.3 Shop Drawing
Submission Req'ts

- .1 Schedule submissions at least forty-five (45) days prior to time at which related product must be ordered to ensure delivery to the construction site when required by the Contractor's Construction Schedule.
- .2 Submit shop drawings electronically as a pdf format document for consultant review and distribution.
- .3 Accompany submissions with transmittal letter, containing:
 - (a) Date
 - (b) Project title and number
 - (c) Contractor's name and address
 - (d) Number of each shop drawing, product data and sample submitted.
 - (e) Other pertinent data.
- .4 Where additional copies of shop drawings or product data are required for distribution, they shall be marked by the Contractor to accord with the copies reviewed by Consultants.
- .5 Submissions shall include:
 - (a) Submission Date and revision dates
 - (b) Project title and number
 - (c) Name of:
 - (i) Contractor
 - (ii) Sub-contractor
 - (iii) Supplier
 - (iv) Manufacturer
 - (v) Separate detailer when pertinent
 - (d) Identification of product or material with manufacturer's related codes and identification numbers
 - (e) Relationship to adjacent structure or materials
 - (f) Field Dimensions, clearly identified as such
 - (g) Specification Section number
 - (h) Applicable standards, such as CSA or CGSB numbers
 - (i) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract documents.
- .6 Send finalized copies of shop drawings to the Client for record purposes (as/if requested).
- .7 Shop Drawings not stamped with the Contractor's "Approved" stamp will be rejected. It is required that all shop drawings be reviewed by the Contractor (for completeness and accuracy) prior to submission to the Architects and/or his Consultants.
- .8 Shop Drawings being submitted by the Contractor which are specified herein as requiring an Engineer's seal will be rejected without review if the appropriate seal is not shown or present at the time of submission to the Consultant.

- .9 Shop Drawings not stamped or otherwise marked with the Architect's acknowledgment of review shall not be used or integrated into the construction in any manner.

END OF SECTION 01340

TEMPORARY FACILITIES

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| 1.1 | Access | .1 Provide and maintain adequate access to project site. |
| | | .2 Build and maintain temporary roads and parking areas where directed and provide snow removal when required during period of work. |
| 1.2 | Contractor's Office | .1 The General Contractor may use the interior construction area as an office within the school. |
| | | .2 The General Contractor is also responsible to provide a temporary fenced-in compound and/or storage container on-site for the receipt, storage and staging of construction materials as may be required. |
| | | .3 Contactor is responsible to: <ul style="list-style-type: none">· maintain all site facilities in clean and operational order throughout the course of construction· remove all temporary site facility items at completion of construction· restore affected areas to their pre-construction condition following removal of temporary facilities· Clean corridors and exterior areas of any debris resulting in materials leaving or arriving from the construction area. |
| | | .4 No existing interior spaces of the subject facility (outside of the designated construction areas) are to be used for the storage or staging of construction materials. |
| 1.3 | Sanitary Facilities | .1 Washrooms noted as part of the construction area may be used as construction washrooms. If separate washrooms are needed then they must be secured in the contractor's compound area. |
| | | .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. |
| 1.5 | Storage Facilities | .1 If required, provide adequate weather tight sheds with raised floors or storage containers for the storage of construction materials, tools, and equipment which are subject to damage by weather. Locations of storage facilities on the property are to be located within fenced compound. |
| 1.6 | Parking | .1 Parking spaces off the subject property will not be allowed unless reviewed and approved by the Municipality. |
| 1.7 | Enclosure of Structure | .1 Provide temporary weather tight enclosures and protection for exterior openings until permanently enclosed. |
| | | .2 Erect enclosures to allow access for installation of materials and working inside enclosure. |

- .3 Design enclosure to withstand wind pressure and snow loading.
- .4 Provide and maintain dustproof and sound resistant barriers or partitions between the Work and existing occupied building.
- 1.8 Power
 - .1 The General Contractor will be provided with power for general construction activities at the existing facility.
- 1.9 Water Supply
 - .1 The General Contractor will be provided with water for general construction activities at the existing facility.
- 1.10 Heating and Ventilating
 - .1 Day-to-day heat and ventilation during the course of construction will be provided under the normal operations of the facility. Supplemental heat as required for construction (above and beyond the daily environmental conditions provided in the facility) shall be the responsibility of the Contractor. All supplemental heat sources and locations shall be approved by the Building Owner if used while the building is occupied during regular hours of operation.
 - .2 Maintain minimum temperature of 10°C or higher where specified as soon as finishing work is commenced and maintain until acceptance of structure by Architect.
 - .3 Ventilating:
 - (a) Prevent hazardous accumulations of dust, fumes, mists, vapours, or gases, in areas occupied during construction.
 - (b) Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - (c) Provide mechanical ventilation to accelerate drying out of building if necessary to maintain schedule.
 - (d) Ventilate storage spaces containing hazardous or volatile materials.
 - (e) Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.
 - .4 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - (a) Conform with applicable codes and standards
 - (b) Enforce safe practices
 - (c) Prevent abuse of services
 - (d) Prevent damage to finishes
 - (e) Vent direct-fired combustion units to outside.

- .5 Activate air system under direction of Engineer to provide temporary heat, after Engineer is satisfied that system will not be damaged by freezing. Product ducting system by disposable filters 50% effective NDS inspected daily and replaced as necessary. Finally, vacuum clean entire ducting system and renew filters.
 - .6 Refer to Section 01710 for replacement of filters at time of final acceptance of work.
- 1.11 Site Signs and Notices
- .1 Only project identification and approved job sign and notices for safety or instruction are permitted on site.
 - .2 Signs and notices for safety or instructions to be in the English language, or commonly understood graphic symbols.
 - .3 Maintain sign and notices for duration of project. Remove sign and deliver to Owner off site on completion of project.
- 1.12 Scaffolding
- .1 Supply and install all scaffolding required to perform the prescribed scope of work. Construct and maintain scaffolding in rigid, secure and safe manner.
 - .2 Erect scaffolding independent of walls. Remove promptly when no longer required. Refer to Section 01545 for safety requirements for scaffolding.

END OF SECTION 01500

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| 1.1 Construction Safety Measures | .1 | Observe and enforce construction safety measures required by the Ontario Building Code, Provincial Government regulatory agencies, Workplace Safety Insurance Board (WSIB), municipal agencies and all prevailing statutes and authorities. Safety requirements throughout the project include both the safety of workers and the safety of building occupants present elsewhere in the facility throughout the course of construction. |
| | .2 | In event of conflict between any provision of the above authorities the most stringent provision will apply. |
| 1.2 Fire Safety Requirements | .1 | Provide and maintain in good working order, sufficient fire fighting equipment, tools, and extinguishers to contain an outbreak of fire. |
| | .2 | Comply with all requirements of the local authorities having jurisdiction in the storage and handling of flammable materials. |
| | .3 | Ensure all persons working at the site are conversant with action to be taken in the event of an outbreak of fire at the Work. |
| 1.3 Overloading | .1 | Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation. |
| 1.4 Falsework | .1 | Design and construct falsework in accordance with CSA S269.1-1975. |
| 1.5 Scaffolding | .1 | Design and construct scaffolding in accordance with CSA S269.2-M1980. |
| 1.6 Hoarding | .1 | Construct temporary construction hoarding as required within and outside of the facility as required to ensure the safety of occupants within the building. Hoarding shall be 6'-0" tall minimum, comprised of opaque plywood on wood framing to and related supports to suit. |
| | .2 | Hoarding shall be self-supporting and not permanently tied into any building materials or finishes. |
| | .3 | Coordinated hoarding locations and scheduling for hoarded areas with Building Owner or operator as required to facilitate use and related access to building areas. No hoarding shall inhibit exit or egress routes in the facility unless expressly permitted by related Authorities Having Jurisdiction. |
| 1.6 Smoking | .1 | Smoking is not permitted on School Board Property. |

END OF SECTION 01545

- 1.1 General**
- .1 Use new material and equipment unless otherwise specified or directed in writing by the Architect.
 - .2 Within (7) days of written request by Architect, submit the following information for any or all material and products proposed for supply:
 - (a) Name and address of manufacturer
 - (b) Product name, model, and catalogue number
 - (c) Performance, descriptive and test data
 - (d) Manufacturer's installation or application instructions
 - (e) Evidence of arrangements to procure
 - .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
 - .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- 1.2 Manufacturer's Instructions**
- .1 Unless otherwise specified, comply with all product manufacturer's latest written instructions for materials and installation methods for the intended application. Comply with and supply all prescribed installation techniques, and materials recommended by the manufacturer as required to ensure the integrity and first-rate installation of related materials.
 - .2 Notify Architect in writing of any conflict between these specifications and manufacturers' instructions. Architect will designate which document is to be followed.
- 1.3 Fasteners - General**
- .1 Provide metal fasteners and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic and all similar negative reactions between dissimilar metals using appropriate materials or techniques. Use non-corrosive fasteners, anchors and spacers for securing exterior work.
 - .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood plugs not acceptable.
 - .3 Keep exposed fasteners to minimum, space evenly and lay out neatly.
 - .4 Fasteners which cause spalling or cracking of material to which anchorage is made are not acceptable.

- .5 Obtain Owner's approval before using explosive actuated fastening devices. If approval is obtained comply with CSA Z166-1975.
 - .6 Use fasteners of standard commercial Equipment sizes and patterns with material and finish suitable for service.
 - .7 Use heavy hexagon heads, semi-finished unless otherwise specified. Use no. 304 stainless steel for exterior areas.
 - .8 Bolts may not project more than one diameter beyond nuts.
 - .9 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and resilient washers with stainless steel.
- 1.4 Delivery and Storage
- .1 Deliver, store and maintain packaged material and equipment with manufacturers' seals and labels intact.
 - .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
 - .3 Store material and equipment in accordance with suppliers' instructions and Section 01500.
 - .4 Touch-up damaged factory finished surfaces to Architect's satisfaction. Use primer or enamel to match original. Do not paint over name plates.
- 1.5 Product Substitutions
- .1 All Tenders are to be based STRICTLY UPON THE ITEMS SPECIFIED IN/ON THE CONTRACT DOCUMENTS (INCLUDING DRAWINGS AND SPECIFICATIONS.) Tender submissions based upon Contractor-elected alternate items, products and/or materials [not approved by the Architect prior to Tender Close] will not be accepted.
- No Contractor-suggested alternate materials will be accepted following Tender if not expressly approved by the Architect in accordance with item .2 below.
- Proposals for alternate materials or products *may* be submitted after Award of Contract if required by the circumstances outlined below. Such requests must include statements relating respective costs of items originally specified against proposed substitutions.

- .2 Alternate materials may be considered by Architect post-Tender if:
 - (a) Products specified at time of Tender are no longer available OR
 - (b) Products specified at the time of Tender cannot be ordered and produced within the Owner's timeframes for project completion (including interim dates for various project phases) OR
 - (c) the proposed alternate products meet with the Architect's approval (relative to qualitative and performance standards) and it also results in a credit amount to the Contract value
 - .3 Should proposed substitution be accepted either in part or in whole, the Contactor shall assume full responsibility of additional costs when substitution affects other work on project, including the costs of design or drawing changes required as result of substitution.
 - .4 Amounts of all credits arising from approval of substitutions will be determined by Architect and Contract price will be reduced accordingly. No substitutions will be permitted without prior written approval of Architect.
 - .5 The Owners reserve the right not to allow substitutions. Products specified are in the Tender Documents reflect Owner's standards for related system and components.
- 1.6 Construction Equipment and Plant
- .1 On request, prove to the satisfaction of Architect that the construction equipment and plant are adequate to manufacture, transport, and install items to the standards, schedule and all related requirements specified. If inadequate, replace or provide additional equipment or plant as directed.
 - .2 Maintain construction equipment and plant in good operating order.
- 1.7 Work Surfaces
- .1 Existing millwork, cabinets, countertops or other similar permanent surfaces, including loose or fixed and installed furniture and equipment are not to be used as work surfaces. Contractors and Subcontractors shall provide their own temporary work surfaces as required.

END OF SECTION 01600

CLEANING

Section 01710
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- 1.1 General
 - .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - .2 Store volatile wastes in covered metal containers and remove from premises daily.
 - .3 Prevent accumulation of wastes which create hazardous conditions.
 - .4 Provide adequate ventilation during use of volatile or noxious substances.
- 1.2 Materials
 - .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- 1.3 Cleaning During Construction
 - .1 On a daily basis maintain premises free from debris and waste material.
 - .2 Maintain project site and public properties free from accumulations of waste materials and rubbish.
 - .3 Provide on-site container for collection of waste materials and rubbish.
 - .4 Remove waste materials, and rubbish from site at regular intervals, or when container is full.
 - .5 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.
 - .6 Schedule cleaning operations so that resulting dust and other contaminants will not fall on areas prepared for finishes and/or wet, newly painted surfaces.

1.4 Final Cleaning

- .1 In preparation for substantial completion or occupancy, conduct inspection of sight-exposed interior surfaces.
- .2 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from sight-exposed interior finished surfaces including glass and other polished surfaces, resulting from own work.
- .3 Clean finished floors ready for sealing and waxing (if req'd).
- .4 Clean lighting reflectors, lenses, and other lighting surfaces.
- .5 Broom clean paved surfaces; rake clean other surfaces of grounds.
- .6 Remove debris and surplus materials from accessible concealed spaces.
- .7 Replace heating, and ventilating filters if units were operated during construction.
- .8 Replace broken, damaged or scratched glass and mirrors, which are part of the Work.
- .9 Use appropriate apparatus and cleaning materials. Clean Work in accordance with applicable Sections and/or manufacturer's directions.
- .10 Upon completion of final cleaning, remove cleaning equipment, materials and debris from building and Site.

END OF SECTION 01700

- 1.1 Record Drawings
- .1 Contractor will provide with two sets of white prints at the outset of construction for the progressive recording of items deviating from the drawings. At the completion of construction, this set of record drawings should reflect final 'as-built' conditions.
 - .2 Maintain project record drawings by accurately and progressively recording deviations from Contract documents caused by site conditions, and changes subsequent to Tender.
 - .3 Mark changes in coloured (red) ink.
 - .4 Record following information:
 - (a) Location and nature of mechanical and electrical building systems and related components not otherwise shown on the drawings.
 - (b) Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
 - (c) Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - (d) Field changes of dimension and detail.
 - (e) All changes made by Change Order.
 - .5 At completion of project and prior to final inspection, neatly transfer notations from the original working set of drawings (for all structural, architectural, electrical and mechanical drawings) to the second final set. Submit both sets to Architect, Mechanical and Electrical Engineers.
 - .6 **The General Contractor, Mechanical Contractor and Electrical Contractor, shall each note a \$2,500.00 Hold Back value (to be identified in all draws) to cover final submission and of As-built drawings and Operation and Maintenance Manuals. Hold back values will be released upon consultant review and approval of completed submittal requirements.**

END OF SECTION 01720

1.1 Manuals

- .1 On completion of project submit to Architect **one USB electronic copy** of Operating and Maintenance Manuals in English, made up as follows:
 - a) Label USB "Operating and Maintenance Data Manual" providing project name and date.
 - c) Organize contents into applicable sections of work to parallel project specification breakdown. Mark each section with Section dividers titled appropriately.
- .2 Include the following information:
 - a) Maintenance instruction for finished surfaces and materials.
 - b) Copy of hardware and Paint Schedules, paint layout drawings, Interior and Exterior Colour and Finish Schedules
 - c) 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 and serial number.
 - d) Names, addresses and phone numbers of Sub-contractors and Suppliers.
 - e) Guarantees, warranties and bonds showing:
 - i) Name and address of projects
 - ii) Guarantee commencement date (date of Final Certificate of Completion).
 - iii) Duration of guarantee.
 - iv) Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
 - v) Signature and seal of Contractor.
- .3 Neatly type all information. Use clear diagrams or manufacturer's literature.
- .4 Final payments will not be made until complete packages, as described at 1.1.1. to 1.1.3, are received by the Board. Promptness and completeness of these packages will be taken into account as part of pre-qualification applications for future Board projects regarding the 'past performance' criteria.
- .5 The General Contractor, Mechanical Contractor and Electrical Contractor, shall each note a \$2,500.00 Hold Back value (to be identified in all draws) to cover final submission and of as-built drawings and Operation and Maintenance Manuals. Hold back values will be released upon consultant review and approval of completed submittal requirements.**

END OF SECTION 01730

- 1.1 General**
- .1 Work of this Section includes demolition and removal from site of materials, finishes, fixtures, equipment etc., [related to the proposed scope of work] which may or may not be specifically spelled out on drawings.
 - .2 Division One [General Requirements] applies as if repeated herein.
- 1.2 Description**
- .1 Work included in this section but not limited to may involve the following:
 - the demolition of portions of the existing building, siteworks, related services and associated features as noted on drawings and/or as required for completion of the scope of work outlined in the Contract Documents
 - the selective demolition of the interior partitions, finishes, building systems, building components, system components etc. noted on the demolition drawings and/or as required for the full scope of work outlined in the Contract Documents
 - the removal (and temporary storage) of items as identified in the drawings for re-use/re-integration into the project [as/where noted on the drawings]
 - the salvaging of items (denoted for removal not intended for re-integration into the project) to be offered to Owner for first right of refusal prior to discarding
 - the removal of items from site and subsequent discard at an approved sanitary landfill site, recycling depot or similar approved facility suited to the nature of materials being removed
 - .2 Clarify all unclear and ambiguous items with Architect immediately prior to demolition and construction.
- The work of this division shall include all temporary and permanent service disconnects required by items being demolished and/or disconnected as part of the scope of work illustrated in the Contract Documents.
- 1.3 Relocation**
- .1 Ensure that all items to be relocated (as per drawings), are carefully removed and stored on site for future relocation complete with all related components and accessories integral to their operation. Protect items during the course of construction to ensure their safety.
 - .2 Clarify all items, which may be ambiguous or unclear with the Architect and/or respective Engineer prior to any removal activity on the site.

- 1.4 Examination**
- .1 Examine site and premises and be satisfied as to condition of premises and means of access to same, and nature and quantity of work required.
 - .2 Examine drawings and documents and report ambiguous items and/or possible errors or omissions to the Architect immediately for clarification.
- 1.5 Coordination**
- .1 Coordinate all demolition activities with Building Owner relative to hours of operation and acceptable level of impact on ongoing building operations (as/if applicable). Work cooperatively with Owner and/or Occupants to determine acceptable hours and activities.
- 1.6 Protection**
- .1 Protect building occupants from demolition activities via construction hoarding or other means deemed acceptable to the Owner. Hoarding provisions to conform to related specification sections elsewhere herein.
 - .2 Throughout demolition, protect all existing building items and areas adjacent to demolition as required to prevent or minimize adverse impact on materials otherwise to remain. Repair and make good all existing finishes damaged throughout the course of construction to pre-construction condition and/or as designated by the Architect.
- 1.7 Utilities**
- .1 Where required, ensure that water, sewer, mechanical and electrical services are cut off and properly capped before commencing remainder of work, and notify appropriate authorities, building owner, building occupants etc. as required.
- 1.8 Removal of Debris**
- .1 All debris from the site and structure demolition, shall be removed from site immediately. There shall be no accumulation of demolished materials any shape or form in any location. All debris shall be removed in accordance with Section 01005 and related divisions as prescribed elsewhere herein.
- 1.9 Hazardous Materials**
- .1 All hazardous materials shall be removed from the facilities prior to demolition otherwise required for the scope of work. Refer to related Specifications and Appendix items contained herein for Designated Substances, Hazardous Materials Abatement and associated items.

END OF SECTION 02100

PART 1 - GENERAL

- 1.1 General .1 Work of this Section includes clearing, grubbing, and removal of site vegetation, as required or intended by the new work and which may or may not be specifically spelled out on drawings.
- 1.2 Description of Work .1 Work included in this section but not limited to may involve following:
- (a) Contractor to contact Architect to confirm cutting of trees.
 - (b) Clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, flush with existing grade and disposing of fallen timber and surface debris.
 - (c) Grubbing consists of excavation and disposal of stumps and roots boulders and rock fragments to not less than a specified depth below existing ground surface.
- 1.3 Protection .1 Prevent damage to trees, (to be preserved), bench marks, root systems of trees which are to remain. Make good damage.

PART 2 - EXECUTION

- 2.1 Preparation .1 Inspect site and verify with City and Architect, items designated to remain.
- 2.2 Clearing .1 Clear trees, shrubs, uprooted stumps and surface debris not designated to remain.
- 2.3 Grubbing .1 Grub out stumps and roots to not less than 200 mm below existing ground surface.
- 2.4 Removal and Disposal .1 Remove cleared and grubbed materials off site to an approved disposal area.
- .2 Chip or mulch may be permitted for use as landscape material but only upon approval of Architect and Owner.
- 2.5 Finished Surface .1 Leave ground surface in condition suitable for immediate grading operations stripping of topsoil.

End of Section 02111

1 PART 1- GENERAL

1.1 SCOPE

- .1 This section refers to the excavation and backfilling for all structures.
- .2 The work includes:
 - a) Excavation of all material including rock and removal of unsuitable materials; offsite disposal of unsuitable materials; and backfilling to lines and grades shown on the drawings.
 - b) Supply of materials and construction of fills.
- .3 Submit reports of soil classification in accordance with Ontario Ministry of Environment and Energy Regulation 558, previously 347, for excavated material and for imported fill material
- .4 On commencement of the work obtain and submit a written agreement from the property owner of the disposal site, setting out terms, conditions, and ultimate responsibility for materials deposited.
- .5 Upon completion of the Works, obtain a release from the property owner of disposal site and submit it to Agency.

1.2 REFERENCES

- .1 CSA A23.1 - Concrete Materials and Methods of Concrete Construction.
- .2 ASTM D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .3 ASTM D2922 -Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- .4 ASTM D3017 - Test Method for Moisture Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- .5 OPSS 1010 -Material Specification for Aggregates - Granular A, B, M, and Select Subgrade Material.
- .6 OPSS 1860 - Material Specification for Geotextiles.
- .7 Regulations for Construction Projects, Ontario Regulation 213/91, made under the Occupational Health and Safety Act, Revised Statutes of Ontario, 1990, Chapter O.1.

1.3 PROTECTION OF EXISTING FEATURES

- .1 Existing buried utilities and structures:
 - a) Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - b) Prior to commencing any excavation work, notify applicable owner or authorities; establish location and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during work.

- c) Confirm locations of buried utilities by careful test excavations.
 - d) Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered. Obtain direction from Consultant before moving or otherwise disturbing utilities or structures.
 - e) Record location of maintained, re-routed and abandoned underground lines.
- .2 Existing buildings and surface features:
- a) Conduct, with Consultant's presence, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, paving, wires and survey bench marks and monuments which may be affected by work.
 - b) Protect existing buildings and surface features which may be affected by work from damage while work is in progress and repair damage resulting from work.
 - c) Record location of surface features.

1.4 REGULATIONS

- .1 Observe all regulations of the current Occupational Health and Safety Act.

1.5 SITE CONDITIONS

- .1 The contractor shall examine the site and approved geotechnical report to ascertain any special condition and become familiar with any object, which may affect the work of this section. No extra payment will be made for work resulting from a failure to know existing conditions. Examine all drawings for work that might affect excavation and backfill.

1.6 CONSTRUCTION METHODS

- .1 Select methods of excavation, dewatering and construction suitable for actual conditions encountered in the work. The Contractor is solely responsible for the safety and adequacy of the method employed.
- .2 Submit proposed construction methods for earthwork construction of all structures for a review two weeks prior to commencement of construction.
- .3 Submit excavation plans showing subgrade elevations, side slopes of open cut excavations and extent of excavation shoring. Indicate new excavations and foundation system in relation to the existing utilities, structures, or surface features that may be affected by works of this contract.
- .4 The submittals will be reviewed for general conformance with project requirements.

1.7 QUALITY ASSURANCE

- .1 All material supplied by the Contractor is subject to inspection and testing at the discretion of the Engineer.

- .2 At least four (4) weeks prior to commencing work furnish the Consultant with a list of sources of materials and provide without charge sufficient samples, tests and reports as may be required for the Consultant's review.
- .3 Provide moisture density curves for each type of imported material if required to be compacted to a specified density.
- .4 Moisture density curves shall be in accordance with A.S.T.M. D698.
- .5 Preliminary approval of material on site, or supplied by the Contractor, does not constitute general acceptance. Acceptance depends upon satisfactory field test results and performance in place.

2 PART 2 - PRODUCTS

2.1 GENERAL

- .1 Obtain fill materials from approved material excavated under this contract. Material obtained from borrows pits or other sources have to be submitted and reviewed by the Consultant. Use borrowed material only if available suitable native material from the excavated material has been used up.
- .2 Fill, backfill and bedding materials shall meet the grad requirements specified. Frozen material shall not be used for backfilling.
- .3 Excavation includes all material excavated to complete the works as specified and shown in the Drawings. No extra payment will be allowed on account of existing trees, tree roots, timber, boulders, quicksand, snow, ice, frost, any combination of these with normal or abnormal earth conditions, or any other obstacles encountered in the excavation, all of which must be removed.

2.2 FILL AND BACKFILL MATERIALS

- .1 Native material: Excavated material as shown on the drawings or borrow material free from roots, boulders larger than 150 mm, organic matter and building debris.
- .2 Granular Fill Materials: Non-frost susceptible composed of clear, hard, durable sand, gravel or crushed rock, free from shale, clay, friable or soluble materials, organic matter and other deleterious substances.
- .3 Granular "A" material: OPSS 1010, Granular "B" material: OPSS 1010, Type mix, as recommended by the geotechnical engineer. When material is not available in natural state, mix graded material at the plant, as required.
- .4 Clear Stone: 19 mm clear crushed stone to OPSS 1004, crushed rock composed of hard, angular fragments produced from rock formations. Granular Fill Materials with minimum 90% passing 22.4 mm sieve and maximum 10% passing 9.75 mm sieve.
- .5 Geotextile:
Non-woven: OPSS 1860; FOS 75 - 150µm, Class II.
- .6 Fill concrete mud slab and mass concrete as per Section 03300.

3 **PART 3 - EXECUTION****3.1** EXCAVATION

- .1 Excavate and remove all materials whatever their nature and condition to depths and dimensions necessary to provide adequate space for piling, foundations, bracing, supporting formwork, piping and drainage, and all other new construction works.
- .2 Excavate and remove all overburden to expose undisturbed native mineral soil. Have the Geotechnical Engineer inspect and approve the subgrade before proceeding with construction of engineered granular fill. Place granular fill to underside of foundations.
- .3 Take all necessary preventive measures to protect the subgrade from disturbance or due to inclement weather or construction activities. Make excavation in the dry.
- .4 Notify Engineer when soil at bottom of excavation appears unsuitable and proceed as directed by Consultant.
- .5 Dispose of unsuitable excavated material off site.
- .6 In addition to the requirements of the Occupational Health and Safety Act, protect excavation faces against erosion or sliding.
- .7 Remove and dispose from the site all natural obstructions, like cobbles and boulders, encountered during excavation.
- .8 Where required due to unauthorized over-excavation, correct at no additional cost to the Agency as follows:
Fill material compacted to 100% SPMDD.

3.2 PREPARATION OF SUBGRADE

- .1 Remove and replace soft spots with granular 'B' fill as prescribed in Section 3.1.
- .2 Immediately following excavation, proof-roll the subgrade with a minimum of two passes of a 2-tonne vibratory compactor.
- .3 Obtain Consultant's approval prior to placing material.

3.3 FILL TYPES AND COMPACTION METHOD

- .1 Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698 corrected maximum dry density.
 - a) Engineered granular fill to underside of base slab: Granular "B" Type 1 (or on-site inorganic soils provided they are not mixed with topsoil and all organic inclusions are removed) placed in 200 mm thick layers and compact to 98% SPMDD.
 - b) Backfill of structures: Granular "B" Type 1 (or approved alternate) placed in 200 mm thick layers and compact to 98% SPMDD.
 - c) Under concrete slabs: provide 150 mm compacted thickness base course of Granular "A" fill to underside of slab. Compact base course to 100%.

- d) Fill to extend a minimum of 2.5 m beyond perimeter of building.
- .2 Backfill only after the concrete of the grade beam wall and bracing slabs have reached adequate strength and when authorized by the Consultant.
- .3 Where possible, place layers simultaneously on all sides of installed work to equalize loading.
- .4 Areas to be backfilled to be free from debris, snow, ice, water or frozen ground. Do not use backfill material, which is frozen or contains ice, snow or debris. All filling material shall have moisture content in the range of $\pm 3\%$ from the optimum moisture content.
- .5 Use mechanical, hand compaction or vibrating plate equipment to compact backfill within 1 m of structures.
- .6 Contractor will rectify all settlement that occurs in the backfill during the maintenance period, at no extra cost to the Owner.
- .7 Backfill to 98% SPMDD within 0.6m of paved surfaces.

3.4 DEWATERING

- .1 Keep excavation free of water while work is in progress.
- .2 Protect open excavation against flooding and damage due to surface runoff.
- .3 Keep ground water level as low as necessary to avoid uplift force on structures.
- .4 Dispose of water in a manner not detrimental to public and private property or any portion of the work completed or under construction.
- .5 Submit for Consultant's review details of proposed dewatering methods.

3.5 DISPOSAL OF MATERIALS

- .1 Dispose of unsuitable and surplus excavated materials off site at approved disposal locations.
- .2 Transport materials in a manner that spillage is minimized.

3.6 RESTORATION

- .1 Upon completion of work, remove from site surplus materials and debris, trim slopes and correct defects noted by Consultant.
- .2 Replace topsoil as indicated or directed by Consultant.
- .3 Clean and reinstate areas affected by work as directed by Consultant.

3.7 INSPECTION AND TESTING

- .1 Testing of materials and compaction will be carried out by designated testing company, retained by the Agency.

- .2 If, during process of the work, tests indicate that specified requirements are not achieved, remove, replace, re-compact and retest at no additional cost to the Agency.

3.8 PROTECTION

- .1 Protect bottoms and sides of excavations from freezing at any times during construction period.
- .2 Maintain adequate protection of bench marks, layout markers, survey markers, survey and geodetic monuments.

End of Section 02220

PART 1 - GENERAL

1.1 Scope of Work

- .1 This section includes the supply and installation of topsoil and planting soil for planting of trees, shrubs, perennials and sod. No peat moss shall be used.

PART 2 - MATERIALS

2.1 Topsoil

- .1 Topsoil shall be a fertile, friable, natural loam; containing not less than 4% organic matter for clay loams and not less than 2% organic matter for sandy loams to a maximum of 15%, and capable of sustaining vigorous plant growth, free of subsoil contamination, roots and stones over 50 mm diameter, reasonably free of weeds, and having a pH range from 6.0 to 7.6.
- .2 No material will be supplied under this item without the approval of the Landscape Architect. **The Contractor shall supply a sample of the intended topsoil and planting mix material to the Landscape Architect one week in advance of placement with soil testing results.** Landscape Architect is to be notified of placement of topsoil.
- .3 The Contractor shall haul topsoil to the areas of the site to be topsoiled and fine-graded along approved routes and shall carefully avoid damage to existing site features and all on-site construction whether complete or in-progress.
- .4 Topsoil and sub-soil contamination of granular and paved surfaces shall be cleaned-up to the satisfaction of the Landscape Architect and Owner and at no extra cost to the Owner.

PART 3 - EXECUTION**3.1 Preparation**

- .1 Grade sub-grade, eliminating uneven areas and low spots, ensuring positive drainage. Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove topsoil that has been contaminated with oil, gasoline, or calcium chloride. Dispose of removed materials as directed.
- .2 Cultivate the entire area which is to receive topsoil to depth of 200 mm. Repeat cultivation in those areas where equipment used for hauling and spreading had compacted sub-grade. Contractor to determine amount of available on-site topsoil.
- .3 Spread topsoil in dry weather over a dry, unfrozen sub-grade. Do not perform operations during heavy rain conditions.

3.2 Spreading of Topsoil

- .1 Keep topsoil 15 mm below finished grade for sodded areas, elsewhere, bring topsoil up to finished grade.
- .2 Topsoil shall be placed in a uniform layer of 150 mm and compacted to 85% SPD.
- .3 Remove stones, roots, grass, weeds, construction materials, debris and foreign non-organic objects from topsoil.
- .4 Manually spread topsoil around trees and plants.
- .5 Ensure that ditches and swales are properly graded with adequate percentage fall to maintain the specified drainage.

3.3 Finish Grade

- .1 Fine grade the topsoil surface to eliminate rough and low areas and so as to ensure positive surface drainage.
- .2 Fine grade surface of topsoil to a smooth, even, loose-textured surface suitable for sodding and/or seeding.
- .3 Roll topsoil with 59 kg roller, minimum 900 mm wide, to compact and retain surface.
- .4 Maintain compaction of 85% Standard Proctor Density on all topsoil areas.

3.4 Excavation - Planting Pits and Beds

- .1 Excavate planting pits and beds to the following depths unless specified otherwise on the drawings:

Deciduous and coniferous shrubs - 450 mm below finished grade.
Deciduous and coniferous trees - same depth as rootball and three times greater than the rootball diameter.
- .2 Shrubs to be planting in continuous beds. For shrub beds excavate to the depth noted and excavate the entire bed to provide 150 mm clear around the perimeter when all shrubs are installed.
- .3 The sides of all planting beds for shrubs shall be vertical and the bottoms horizontal. Tree pits shall be horizontal on the bottom and sloped on the sides as per detail. Unless otherwise specified, the excess materials excavated from the holes shall be spread in the immediate area as directed by the Landscape Architect/Owner. The excavated material shall not be stockpiled on turf or in ditches. The sides of holes shall not be grazed or smooth but be scarified.
- .4 Holes for shrubs and vines shall be dug within the marked outline of the planting bed. The interval of planting will be as shown on the plans. Plants of single depth shall have staggered planting unless otherwise indicated on plan.
- .5 Existing vegetation on the area shall be mowed or treated with a non-selective, post emergent non-residual herbicide. The area shall then be tilled to a minimum depth of 50 mm until free of debris, gullies, clods, weeds, stones and roots.

End of Section

PART 1 GENERAL

1.1 DESCRIPTION

- .1 This Section is supplemental to OPSS 401 and shall supersede conflicting specifications within OPSS 401.

1.2 RELATED SPECIFICATION

- .1 Construction Specification Section 01300 - Submittals
- .2 Construction Specification Section 01401 - Quality Control
- .3 Construction Specification Section 01560 - Environmental Protection
- .4 Construction Specification Section 02220 - Excavating, Backfilling and Compacting for Structures
- .5 Construction Specification Section 02511 - Watermains
- .6 Construction Specification Section 02530 - Pipe Sewers
- .7 OPSS 180 - General Specification for the Management and Disposal of Excess Material
- .8 OPSS 201 - Construction Specification for Clearing, Close Cut Clearing, Grubbing and Removal of Surface and Piles Boulders
- .9 OPSS 401 - Construction Specification for Trenching, Backfilling and Compacting
- .10 OPSS 404 - Construction Specification for Support Systems
- .11 OPSS 1004 - Material Specification for Aggregates - Miscellaneous
- .12 OPSS 1010 - Material Specification for Aggregates - Base, Sub base, Select Sub-grade, and Backfill Material
- .13 OPSS 1359 - Material Specification for Unshrinkable Backfill

1.3 DEFINITIONS

- .1 Earth Excavation: All excavation other than Rock Excavation including removal of frozen earth and cemented till.
- .2 Excess Excavation: All excavation beyond that specified performed without written order of Engineer.
- .3 Standard Proctor Density: As defined in ASTM D698.

1.4 STABILITY OF TRENCH

- .1 Employ such construction methods, plant and materials as shall ensure that migration of fine soil material into pipe bedding or sub-bedding from adjacent ground shall not take place.

PART 2 PRODUCTS

2.1 BACKFILL MATERIALS

- .1 Bedding and Cover Materials:
 - .1 Do not include materials greater than 19 mm in size.
 - .2 Sand shall conform to the requirements of OPSS Granular 'M' as specified in OPSS 1010.
 - .3 Granular 'A' to OPSS 1010
 - .4 16 mm Clear Stone to OPSS 1004 Table 2.
 - .5 Select Native Material (when specified).
 - .6 Concrete: to OPSS.MUNI 1350 (only acceptable when specified).
- .2 Select Native Material:
 - .1 Native material in accordance with Subsection 401.05.05.02 of OPSS 401. Refer also to the geotechnical report appended to this Specification.
 - .2 Material at moisture content to enable optimum compaction.
- .3 Granular Materials:
 - .1 Granular A: to OPSS 1010
 - .2 Granular B: to OPSS 1010, Type I
- .4 Unshrinkable Backfill:
 - .1 Unshrinkable Backfill: to OPSS 1359
 - .2 Admixtures shall conform to OPSS 1303 and the latest MTO designated sources list. Calcium chloride or pozzolanic mineral admixtures shall not be used. Air entraining admixtures may be added if desired by the Contractor.

- .5 Imported material:
 - .1 Material from source approved by Consultant.
 - .2 Materials free from frozen lumps, cinders, ashes, refuse, vegetable or organic matter, rocks and boulders over 150 mm in any dimension, or other deleterious materials.
- .6 Do not use any material until approved by Consultant.
- .7 Do not use shale or thinly bedded limestone, which may break up on exposure or freezing.
- .8 Recycled hot mix asphalt or excess bituminous pavement shall not be used as trench backfill or bedding.

PART 3 EXECUTION

3.1 PAVEMENT REMOVAL

- .1 Saw-cut existing asphalt in neat, consistent, parallel lines. Ensure saw-cut edges are clean and vertical.
- .2 Do not use backhoe bucket or drop weight to break pavement.

3.2 REMOVAL OF FROZEN GROUND

- .1 Remove frozen ground in accordance with OPSS 401. Method of removal of frozen ground shall not cause excessive noise or ground vibration.

3.3 TRENCHING

- .1 Notify Consultant if bottom of trench appears to be unsuitable for foundation. Excavate unsuitable material as directed by Consultant until satisfactory foundation is attained and backfill with approved granular material.
 - .1 Soils on site are classified as Type 3 soils.
 - .2 Stockpile excavated material suitable for trench backfill.
 - .3 Separate materials that are unsuitable for backfill.
- .2 Perform corrective measures ordered by Consultant to rectify deficiencies caused by excess excavation.

3.4 WORKING MAT

- .1 Place layer of granular material where necessary to protect trench bottom.

- .2 Place working mat layer immediately after excavation has been completed.
- .3 Do not encroach on bedding thickness under pipe.
- 3.5 BEDDING
 - .1 Class B bedding to OPSD 802.
 - .2 Minimum bedding thickness below pipe to be 150 mm.
- 3.6 COMPACTION
 - .1 Do compaction to OPSS 501.
 - .1 Stone in sub drain areas to be compacted using several passes of a 250-kg minimum weight vibratory plate. The plate compactor should not be so large that it breaks/crushes the individual stone particles or the sub drain pipes.
 - .2 Backfill to be compacted to 95% SPMDD. This is to be increased to 98% SPMDD within 0.6 m of the road subgrade surface.
 - .3 Lifts not to exceed 200 mm thickness.
 - .4 Use Quality Control Method A in accordance with Subsection 501.07.04.02 of OPSS 501.
 - .5 Use Quality Assurance Method A in accordance with Subsection 501.08.02 of OPSS 501.
- 3.7 DISPOSAL OF EXCAVATED MATERIALS
 - .1 Dispose of unsuitable and surplus excavated materials to OPSS 180.
 - .2 Transport materials in a manner such that spillage is avoided.
- 3.8 TESTING
 - .1 Do testing to Section 01450

End of Section 02315

PART 1 - GENERAL**1.1 General Conditions**

- .1 The Information to Tenderers and Division 1 General Requirements shall form a part of this Section.

1.2 Work Included

- .1 The Contractor shall supply all labour, materials, equipment and services necessary to complete the Pavements as shown on the drawings and as specified herein and including the following items of work:
 - .2 Placing asphalt onto previously prepared road, playground, parking and sidewalk in the areas and to the elevations shown on the site plan drawings.
 - .3 Place all new concrete, sidewalk, walkways, curbs and miscellaneous site concrete (footings for signs, benches etc.) as indicated on the drawings included related sub-base installation.
 - .4 Restoration of asphalt pavements, concrete curbs and sidewalks to match existing where disturbed under this contract.

1.3 Co-ordination

- .1 All work shall be carried out in co-ordination with the City and the Owner to create minimum interference with access to or along public roads. Maintain existing School activities during construction.

1.4 Testing and Inspection

- .1 The General Contractor will engage the services of an independent testing company to confirm the satisfactory placing and compaction of backfill materials. Reports shall be forwarded promptly to the Consultant's office. (Refer Section 312310). The payments for the testing and inspection shall be drawn from a Cash Allowance (refer Division 1) set aside for this purpose.

1.5 Standards:

- .1 All work in this section shall be carried out to OPSS requirements Regional, City Engineering standards whichever is more stringent.
- .2 Start of asphalt paving operation implies the contractor's acceptance of the work by Division 312310 (sub-base of pavements).

1.6 As Built Grading:

- .1 At the completion of the project, the Contractor shall be responsible for providing to the Engineer, a marked-up drawing signed by the site superintendent, of the as built finished elevations confirming the pavement and landscaped areas were built in accordance with the design drawings approved for Site Plan Agreement.

PART 2 - MATERIALS2.1 Materials

- .1 All granular materials shall satisfy the requirements of OPSS. 1010.
- .2 All asphalt shall satisfy the requirements of OPSS. 1150.
- .3 Site concrete shall be as specified to OPSS 1350 with a minimum strength of 32 MPa in 28 days, a maximum slump of 70 mm (3") and an air content of $6\% \pm 1.5\%$ and W/C ratio a maximum of 0.45.
Water: Verify that no salts are present which will cause efflorescence.
Cement: Portland Standard type 10, conforming to the requirements of CSA A5.
Aggregate: Natural sand, gravel, or crushed rock. CSA Standard A23.1 shall govern for approval and control of fine and coarse aggregates, and their grading. Provide aggregate from the same source for entire Project for concrete exposed to view.
Air Entraining Admixture: To provide 6% entrainment to meet specified requirements of CSA Standard A266.1:
- .4 Expansion joint material shall be 12 mm (½") Flexcell fibreboard as manufactured by Sternson Limited, or approved equal.

PART 3 - EXECUTION3.1 Preparation

- .1 Beneath the access road and parking pavement confirm the placement of the specified thickness of granular "A" and "B" materials and compaction of 100% Standard Proctor Dry Density.
- .2 Test compaction using an approved testing agency and forward results to the Engineer. If the sub-base thickness is insufficient, report to the Consultant. Carry out further compaction until the specified level is reached.
- .3 Contractor shall verify that all surfaces slope in accordance with grades and are true to the elevations shown on the drawings prior to placing asphalt courses.

3.2 Restoration of Existing Paved Areas.

- .1 The contractor shall restore the existing road surfaces to conditions equal to that required by City Standards. Ensure joints between existing and new asphalt is square and straight; match surface levels on each side of the joint.
- .2 Backfill service trenches for the full height with compacted Granular "B" material (Section 02400).

3.3 Concrete Sidewalks and Pavements

- .1 Concrete sidewalks and pavements shall be, unless otherwise noted in this specification, constructed in accordance with the minimum requirements of OPSS 351 and OPSD 303.01 and OPSD 303.03. All slabs shall be a minimum of 100 mm (4") thick using 32 MPa concrete reinforced with 152 x 152/MW 18.7 x MW 18.7 WWF placed not more than 40 mm (1.5") from the top surface. Provide joints as specified in OPSD 310.01; light broom finish the surface, and round all edges and joints to a 12 mm (1/2")radius.

Note: control joints in external sidewalk slabs shall be placed in a pattern specified on the landscape plan. Saw joints shall be at no greater than 2134 mm centres (7 feet), expansion joints at 5400 centres (18 feet).

Ensure that all concrete walkways positively slope away from the building at a min. 1.5% gradient delivering storm water away from the building.

Concrete barrier and rolled curbs [where indicated] shall be constructed to OPSS 353 and OPSS 354 in accordance with OPSD 600.03 from 32 MPa concrete

3.4 Clean-up

- .1 Clean all roadways, sidewalks, curbs, etc. to leave in an acceptable condition.

3.5 Asphalt Pavements

- .1 Access Roadway- Heavy Duty
 Used by passenger vehicles as well as delivery and garbage trucks and the occasional fire truck. The asphalt pavement provide 80 mm (3.15") thick HL8 base course and 50 mm (2.0") HL3M surface course.
- .2 Parking area- Light Duty
 Used by passenger vehicles only. The asphalt pavement provide 50mm(2") thick HL8 base course and 40 mm (1.5") HL3M surface course.
- .3 Pathways and Playground surface:
 Used by pedestrian traffic and ride on light duty snow removal equipment only HL3M 50mm (2.0")
- .4 Test for the compaction of the asphalt pavement and submit results to the Engineer for review. Each layer shall be compacted as recommended by the Soils Engineer, to the specifications of the Niagara Peninsula Standard Contract Document or the City of St. Catharines specifications whichever governs this project.

END OF SECTION 02515

SODDING

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3.3 Sodding

- .1 Supply and install sod. Sod shall be cut and laid within 24 hours. Lay sod tightly together without gaps.
- .2 Moisten areas to receive sod and water immediately upon completion.
- .3 Roll to level even surface.
- .4 Maintain sod for a period of one (1) month including watering and mowing as required to produce healthy turf, uniform in texture and colour.
- .5 Sod shall not be laid when in a frozen condition, nor upon frozen ground, nor under any other condition not favourable to transplanting or growth of the sod.

End of Section 02600

PART 1 - GENERAL

1.1 Scope of Work

- .1 This section describes the supply of all labour, materials, tools, services, and incidentals to do all planting within designated project areas and where shown on drawings.

1.2 Qualifications

- .1 All planting and related work shall be done by experienced, qualified personnel under the direction and supervision of foremen with at least ten (10) years of horticultural and planting experience.
- .2 The work shall be done to conform with best horticultural practice and the specifications.

1.3 Testing

.1

Testing is required for all imported topsoil.

- .2 Test for N, P, K and minor element values, soluble salt content, organic matter and pH value using an approved, independent inspection and testing agency.
- .3 Arrange for and be responsible for costs related to soil testing.
- .4 Submit soil testing report to Landscape Architect before commencing work.
- .5 When topsoil from one source is exhausted and more topsoil is required, topsoil from new source shall be tested before continuing work.
- .6 Conform to recommendations from soil testing agency with respect to improvement of tested topsoil.
- .7 Adjust fertilizer requirements and rates as well as addition of other additives to conform to soil testing report recommendation, at no extra cost to the Contract.

1.4 Samples

.1

Submit samples of topsoil, planting mix, mulches and accessories for tree guying. All work shall conform to approved samples.

.2

Plants:

- (a) Each species or variety shall be handled and packed in

the manner approved for that plant, having regard for the soil and climatic conditions at the time and place of digging and of delivery, and to the time that will be consumed while in transit or delivery. All precautions that are customary in good trade practice shall be taken to ensure the arrival of the plants in good condition.

- (b) Protect plants from damage and drying out from the time of digging until planting. Do not store on asphalt.
 - (c) When shipment is made by enclosed vehicle, the vehicle shall be adequately ventilated to prevent any "Aheating" in transit.
 - (d) Plants with broken or abraded trunks or branches or with broken or cracked rootballs or plants which are desiccated will be subject to rejection upon arrival on the project site.
 - (e) All plant materials which cannot be planted immediately upon arrival on site shall be properly heeled in or well protected with soil or similar material to prevent drying out and shall be kept moist until commencement of planting.
- .3 Co-ordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.
 - .4 Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure, and extreme temperature change during transit. Avoid binding of planting stock with rope or wire which would damage bark, break branches, or destroy natural shape of plant. Give full support to root ball of large trees during lifting.
 - .5 Proceed with planting operations only during suitable weather conditions. Do not plant when weather goes below 10 degrees C, or during heavy rain conditions. Do not plant in times of severe heat or drought.

1.5 Acceptance at Substantial Completion

- .1 Maintain all plant materials, planting areas and accessories immediately after plants have been planted and continue such maintenance until substantial completion, ensuring that at substantial completion:
 - (a) all plants have been maintained such that they are in a vigorous, healthy, growing condition.
 - (b) all planting beds have been cultivated and planting beds and tree saucers have been kept free of weeds at all

times.

- (c) Remove all debris, broken branches, etc., and maintain planting beds in a neat condition at all times. Water, when necessary, with sufficient amounts to saturate root system.
- (d) plants have been inspected regularly for diseases and insect
- (e) infestations, and immediate measures have been taken to eliminate such diseases and infestations.
- (f) any chemicals intended for use have been approved by Owner and used in strict accordance with manufacturer=s recommendations. Post notice of such application with appropriate warnings after application.
- (g) Contractor has assumed full responsibility and repaired, replaced, or remedied otherwise all damages resulting from the use of such chemicals at no extra cost.
- (h) all plants and trees shall be completely free of diseases and/or insect infestations. Tree guys shall be taut and all accessories in good condition as specified. All planting beds and tree saucers shall be freshly cultivated and free of all weeds and debris.

1.8 Warranty (Scope of Work)

.1

Submit written guarantee to the effect that all:

- (a) Plants accepted during the period from January 1st to July 15th shall be guaranteed until July 15th, twenty four (24) months later.
- (b) Plants accepted during the period from July 15th to December 31st, shall be guaranteed for a period of twenty four (24) months from the date of acceptance.
- (c) The guarantee periods, listed above, shall apply to all "nursery-grown plants".

.2 Contractor to submit written guarantee before acceptance by Landscape Architect.

1.9 Warranty (Plants)

- .1 Notify the Landscape Architect, in writing, of any corrective or preventative measures necessary to safeguard plants.
- .2 During the guarantee period, make periodic inspections and replace all plants which are dead, missing, or which are not in a healthy, vigorous growing condition.
- .3 All plant materials will be inspected by the Landscape Architect at the end of the guarantee period.

- .4 At time of such inspection, all plants shall be in a healthy, vigorous growing condition as per specifications.
- .5 Plants shall be completely free of diseases and insect infestations, and all accessories, such as guys, stakes, wrappings, etc. shall be in place, in strict accordance with details, drawings, and specifications.
- .6 Planting beds and tree saucers shall be freshly cultivated and free of debris and weeds.
- .7 Owner reserves the right to extend Contractor's warranty responsibilities for an additional year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.
- .8 The warranty provided is not a maintenance contract and it is the Owner's responsibility to provide adequate maintenance during the specified time after substantial completion, in order to sustain plant growth.

1.10 Warranty (Replacements)

- .1 During warranty period, remove from site any plant material that has died or failed to grow satisfactorily as determined by Landscape Architect.
- .2 Replace plant material immediately or in the next planting season.
- .3 Extend warranty on replacement plant material for a period equal to the original warranty period.
- .4 Continue such replacement and warranty until plant material is acceptable.
- .5 Notify Architect of source of material at least 7 days in advance of shipment. No work under this Section is to proceed without approval.
- .6 All required replacements shall be plants of the same size and species as specified on the plant list and shall be supplied and planted in accordance with the drawings and specifications as directed by the Landscape Architect.

PART 2 - MATERIALS

2.1 Planting Mix

- .1 Planting amendments to be used shall be one part well-

rotted manure, one part leaf mould, 2 parts imported sandy loam topsoil. Contractor to provide soil sample to landscape architect one month prior to placement with testing results indicating soil mix composition and proof that specified soil mix is weed free. Failure to do so may result in rejection of soil mix at time of installation. Landscape Architect's decision in this matter is final.

- .2 Planting amendments shall be placed on deeply cultivated planting areas and thoroughly premixed before placement in beds. **Architect (or Landscape Architect) is to be present on site during placement of soil in all planting areas.** Should Landscape Architect not be notified of soil placement, and thereby make a periodic site inspection and find planting soil in place, a Stop Work Order may be issued if planting mix is not as specified. Contractor will be fully responsible for replacement of soil to meet specifications and must accept full responsibility for subsequent delay in work and all associated costs. Architect's decision in this matter is final.

2.2 Plant Accessories

- .1 Mulch shall be a finely shredded hardwood bark mulch produced when raw round wood products are mechanically debarked by conventional type debarking units. The processed shredded bark material shall consist of an array of bark shreds and particle sizes ranging from fines up to and including coarse shreds and particles large enough to be refused by a 25 mm mesh screen. Bark slabs and particles greater than 50 mm will not be permitted. Bark seeding mulch particle size distribution shall be ascertained and approved as acceptable by the Architect prior to application. Mulch shall be source from **Submit sample of mulch for approval one month prior to installation.**

PART 3 - EXECUTION

3.1 Site Preparation

- .1 Stake out all tree locations and planting beds and obtain approval from the Architect (or Landscape Architect) before excavating. Co-operate with Architect where minor adjustments to such locations are necessary.
- .2 The location of trees and planting areas, where shown on drawings is approximate only and may require adjustment due to site conditions. When dimensions are indicated on the planting plan they are to be strictly adhered to. Should

any on site condition affect placement of plants Architect (or Landscape Architect) must be contacted to oversee adjustments.

3.2 Excavation

- .1 Provide drainage for planting holes in heavy soil if natural drainage does not exist. Method to be approved by the Landscape Architect.
- .2 Remove water which enters excavations prior to planting. Ensure source of water is not ground water.
- .3 Excavated soil to be removed to area within site as designated by the Landscape Architect or Owner.
- .4 Excavate planting pits for trees according to planting details.

3.3 Soil Preparation

- .1 Entire shrub border to be amended with products as specified. Backfill planting beds and tree pits with a planting soil as specified.
- .2 Add bonemeal to the soil mixture at the rate of 1 lb. per m³.
- .3 Mix topsoil, and other additives thoroughly on the site, not more than two (2) days before backfilling.
- .4 Do not mix or backfill when topsoil or soil mixture is in a muddy or frozen condition.
- .5 Backfill to a height above finished grade sufficient to allow for normal, natural settlement.
- .6 Finished grade, after settlement, shall be 25 mm below all hard surfaces. This is without cover of mulch.
- .7 Backfill soil mixture in layers not exceeding 100mm in depth.
- .8 Tamp each layer firmly before placing subsequent layers.

3.4 Planting

- .1 Planting shall be done during periods suitable with respect to weather conditions and locally accepted practice and to the Architect's approval. Plants shall be set plumb in the centre of the pit at the same relation to grade as originally grown, after settlement has taken place.
- .2 Trees and other plant materials shall be faced to give the best appearance or relationship to adjacent structures, and to the approval of the Landscape Architect.
- .3 Remove all ropes, wires, etc. and pull burlap away from top of root ball. Wire baskets shall have upper wires cut and removed. All shrubs shall have plastic or fibre pots

removed and root ball carefully cut in three places, vertically, to a length equally 2 the total height of the rootball.

- .4 Constantly tamp soil around root ball to eliminate air pockets.
- .5 Soak soil mixture thoroughly with water when hole is filled halfway.
- .6 Fill hole completely, leaving a shallow saucer directly over root ball, slightly smaller in diameter than the excavation.
- .7 Water trees and planting beds thoroughly immediately after planting.
- .8 Planting shall be done in a continuous operation, completing total areas rather than individual species.
- .9 Mulch shall not be placed directly against the trunk of the tree or shrub.
- .10 All planting soil, additives, mulch, broken plant parts to be removed from adjacent lawn, walkways and parking areas.

3.5 Tree Staking

- .1 Samples of all accessories must be approved by the Landscape Architect prior to the start of planting and consistency of materials shall be maintained throughout the project.
- .2 After planting, support all trees as detailed on drawings.
- .3 The positioning of the tree staking is to be determined on site according to the prevailing wind direction.
- .4 Wires for fastening to anchors shall be pliable # 9 gauge minimum galvanized iron wire for trees.
- .5 New black rubber nose, two-ply, reinforced and 1/2" (12.5mm) in diameter, or approved equal, shall be used to encase wires where they circle trunk or branches. Allow one finger width of space between trunk and hose to allow for movement of tree in wind. Failure to do so will result in reject of planting.
- .6 Trees shall be supported with two flexible tree wraps fastened around two new wood stakes.
- .7 Do not damage root ball when staking trees. Stakes are not to be driven through root ball.
- .8 Trees not staked are subject to all requirements of this specification including guarantee.
- .9 During the life of the contract, if trees blow down, sway

excessively, or are otherwise injured because of improper bracing, the Landscape Architect will reject such injured trees and they shall be replaced by the Contractor at his/her own expense.

3.6 Pruning

- .1 Do pruning only as necessary to remove dead and broken branches and to compensate for the loss of roots as a result of digging operations in the nursery.
- .2 Preserve the natural form and character of plants and do not remove small twigs along tree trunks.
- .3 Use only sharp, clean tools, sanitized and make cuts flush without leaving stubs and treat all cuts 25 mm in diameter and larger with approved tree paint.
- .4 Trace back to living tissue all cuts, bruises, and scars on the bark and treat with tree paint. Smooth and shape wood so as not to retain water.

3.7 Watering

- .1 Keep all plants well watered from time of planting until acceptance.
- .2 Apply sufficient water to saturate root system, but do not overwater.

3.8 Mulching

- .1 Install approved mulch in all tree saucers and where shown on drawings to a minimum depth of 100mm around trees and shrubs and 50 mm around perennials.
- .2 Cultivate soil and remove weeds before placing mulch.
- .3 Ensure mulch does not come in contact with trunk of tree or base of shrub.

3.9 Cleanup

- .1 Immediately after planting, remove all debris and excess material from the site leaving the area neat and tidy. Clean all areas which are contaminated as a result of planting operations.
- .2 Maintain all areas neat and tidy at all times until substantial completion acceptance.
- .3 Do not burn debris and rubbish unless approved by the Architect (or Landscape Architect).

3.10 Protection and Maintenance

- .1 Assume full responsibility for protection and maintenance of all planted areas until substantial completion.
- .2 Erect protective fencing and post signs where necessary and maintain such works until acceptance and remove same after acceptance of work, unless directed otherwise.
- .3 Maintenance shall include, but is not limited to, weeding, pruning, watering, disease control, adjustment of accessories.

3.11 Final Inspection and Acceptance

- .1 At time of final inspection to authorize substantial completion, all plants shall be in a healthy, vigorous, growing condition and planted in full accordance with drawings and conditions. Final inspection to occur no sooner than 45 days after installation.
- .2 Planting beds and tree saucers shall be freshly cultivated and free of all weeds and debris.
- .3 Any plants found dead, missing, or unacceptable at time of final inspection may delay acceptance of other work included in the Contract.
- .4 Partial acceptance will be considered when approved, in writing by the Landscape Architect, and upon receipt of written application by the Contractor.
- .5 Requests for partial acceptance must be based on completion of all work within well defined areas.

3.12 Guarantee

- .1 All plant material will be inspected by the Landscape Architect and Owner at the end of the guarantee period.
- .2 At time of such inspection, all plants shall be in healthy, vigorous growing condition as per specifications.
- .3 Planting beds and tree saucers shall be freshly cultivated and free of debris and weeds.
- .4 Plants shall be completely free of diseases and insect infestations and all accessories, such as guys, stakes, wrappings, etc. shall be in place, in strict accordance with details, drawings, and specifications.

End of Section

PART 1 - GENERAL

- 1.1 Description of Work .1 The work to be done under this section shall consist of the supply of all materials, labour, supervision, plant, and equipment to complete all concrete work shown on the drawings and specified herein. Carefully examine all drawings and the site to determine the extent of the work. Without limiting the foregoing, the following is included in this division.
- (a) Footings, piers and foundation walls.
 - (b) Interior concrete floor slabs at or above grade.
 - (c) Setting of anchor bolts.
 - (d) Supply of beam and vertical reinforcing bars for Section 04220.
 - (e) Patching of concrete floor slabs and existing concrete structural systems at all points of demolition and/or installation of new items associated with the scope of work.
 - (f) Supply and installation of concrete hardeners, densifiers and/or sealers
 - (g) Supply and installation of new concrete toppings, self-levelers etc.
- NOTE: this Section and the requirements herein are provided as complementary to [and not over-riding] concrete specifications otherwise prepared by the Structural Engineer.
- 1.2 Work not Included (a) Mortar for masonry.
- 1.3 Standards .1 In referring to standards, it shall be understood that reference is made to the latest edition available at the time of the tender submission.
- .2 Reference Standards:
- CSA A23-1/A23-2 Concrete Materials and methods of concrete construction/methods of test for concrete.
 - CSA A23-3 design of concrete structures.
 - CSA S269-3 Concrete Formwork.
 - CSA G30-14 Deformed Steel wire for Concrete reinforcement
- 1.4 Protection Store materials to protect them from deterioration. Protect the work of this section from damage resulting from the work of other sections. Repair or replace at no cost to the Contract.

PART 2 - PRODUCTS

2.1 Materials

- .1 Portland Cement, Normal Type 10, in accordance with C.S.A. Specification (CAN 3.A5).
- .2 Steel reinforcing bars shall comply with C.S.A. Specifications G30.12 and G30.16 for deformed bars having a guaranteed minimum yield strength of 60,000 p.s.i. (400MPa)
- .3 Wire mesh shall comply with C.S.A. Specification G30.5 and shall be of minimum size 6 x 6 - W6\W6 unless noted. Mesh shall be delivered to site in flat sheets.
- .4 Concealed aggregate: In accordance with C.S.A. Specification CAN 3-A23.1-M. In general, coarse aggregate shall be no greater than one-quarter minimum section being poured. Maximum aggregate dimension 3/4". Fine aggregate to be water-washed lake sand free from organic material.
- .5 Water reducing Agent: "Plastiment: as manufactured by SIKA Chemical of Canada Ltd. or approved equal. Use in accordance with manufacturer's directions.
- .6 Control Joint: Premoulded joint shall be "Zip-Strip" by Blok-Lok.
- .7 Air Entrainment Agent: Add for any concrete exposed to freeze-thaw action according to manufacturer's instructions. Shall be SIKA AER as manufactured by SIKA Chemical of Canada Limited or equal conforming to CAN 3 A266.1 and A266.2. Add according to manufacturer's recommendations to entrain 5% to 8% air by volume as set down in CAN3.A23.1 Table 7 & 8.
- .8 Water: Fresh and clean, taken from municipal water supply, free from deleterious substances and salts that may cause efflorescence.
- .9 Dry Pack Non-shrink Mortar: "Embeco" by Master Builders Co. Ltd., or equal premixed to 30MPa strength, for setting below column and beam baseplates.
- .10 Form Materials: Exterior grade fir plywood of good quality and sound construction and in new condition. Form lumber shall be free from defects and warp.
- .11 Expansion Joint: At slab perimeter 1/2" "Flexcell" by Sternson or W. R. Meadows Sealtight asphalt impregnated cane fibre.
- .12 Vapour Barrier sheet: 10 mil polyethylene; see Section .07165.

2.1 Materials (Cont'd) .13 Concrete Properties/Minimum Standards:

Mix Location	28-Day Compressive Strength (Mpa)	Slump (mm)	Air Content	Exposure Class
Lean Concrete Fill	15	150	Nil	-
Slabs-on-grade (interior)	30	75±25	Nil	-
Concrete Toppings	30	75±25	Nil	-
Exposed Concrete Foundation walls	32	75±25	5%±1%	F2
Footings	20	75±25	Nil	-
Exterior slabs-on-grade, and side-walks	32	75±25	6%±1%	C2

.14 Concrete strengths, slumps, and air entrainment contents are to be as indicated on attached table.

.15 **Clear Concrete Hardener and Sealer [CSH]:**
Where indicated on drawings and as noted herein, supply and install clear concrete hardener/densifier sealer. Product to be used on all concrete floors not being covered with another flooring material/finish.

Acceptable concrete hardener/sealers include:

- W.R. Meadows Sealtite Liqui-Hard
- Niagara Protective Coatings Lithi-Glas Densifier

All items are to be applied in full accordance with manufacturer's recommendations for the intended application to provide recommended max. dry film thickness. Products to be applied in full accordance with manufacturer's recommended application techniques and ambient environmental conditions at time of installation.

.16 Accelerating or retarding chemical mixtures shall only be used with prior approval of Consultant. **Do not** use calcium chloride or products containing calcium chloride.

.17 Concrete for repair and patching of concrete floor slabs shall be suitable for the thickness and extent of the work. Use shrinkage reducing admixture to minimize the gap in the cold joint between new and existing concrete. Submit specifications for the material to be used for approval by the Engineer.

.18 **Concrete Self-Levelling [CSL] Toppings:**

Supply and install self-levelling concrete toppings where specified on drawings, where noted on Room Finish Schedule and/or as noted herein.

All toppings to be cement-based or other non-gypsum based products. Toppings to be selected to suit the intended application ensuring:

- compatibility of topping with applicable substrate material and conditions
- full adhesion between topping and substrate
- compatibility of topping thickness capabilities to site requirements [min. and max. topping thicknesses]
- use of appropriate aggregates in topping [if required] to achieve high-build thickness requirements
- ability of topping to be feathered or tapered to 0 as/if required
- viscosity, flow and self-levelling capabilities of topping suited to site requirements and environmental conditions
- pumping ability of topping as/if required suited to site requirements
- compatibility of topping dry-time with project requirements

Prior to installation of self-levelling topping, also ensure use of the following [as/if required]:

- manufacturer-recommended adhesion primers
- manufacturer-recommended sub-floor patch materials, fill and crack repair agents etc. and miscellaneous items as required to ensure the integrity of the topping installation

Acceptable self-levelling concrete toppings include:

Ardex K16

Ardex K15

or approved alternates.

PART 3 - EXECUTION

3.1 Formwork

- .1 Obtain approval of forms prior to erection. Forms may be omitted only as and where directed on site by the Architect.
- .2 Neatly build forms to exact dimensions of members substantially water-tight and of sufficient strength to amply carry loads imposed thereon without deflection. Clean forms prior to and after placing steel. Provide all necessary ties to ensure that no metal will be within 25mm(1") of the exposed concrete surface.
- .3 Provide 12-15mm (1/2" - 5/8") chamfers on all exposed concrete edges unless otherwise specified in the details.
- .4 Use a non-staining form release agent on the inside of all forms. Extreme care should be taken to ensure that the reinforcement is clean of all agents.
- .5 Build in anchor bolts and other items furnished by other Trades.
- .6 Tolerances in formwork:
Footings +/- 1/2"
Slabs on Grade +/- 1/16"
Walls/Suspended Slabs +/- 1/16"
- .7 No tolerances at doors or partitions.
- .8 Be solely responsible for the safety of the structure before and after forms are removed. The following are minimum times for removal of formwork after concrete is placed:
- .9 Formwork shall be removed in such a manner as to ensure the safety of the structure and to prevent chipping or cracking of the concrete. Do not remove before the concrete has gained sufficient strength to support the imposed loads and not before that period specified by CAN3- A23.1M

3.2 Preparation

- .1 All reinforcing bars shall be bent cold. All bends in reinforcement shall have an inside radius of at least 5-bar diameters and all hooks a straight return of 4-bar diameter.
- .2 Material used in handling concrete shall be freshly cleaned; forms shall be thoroughly wetted and oiled and reinforcement shall be cleaned of ice, frost, or other deleterious material.

- .3 Sub base: Ensure the sub grade below all slabs on grade has been proof rolled to the minimum specified compaction of 98% Standard Proctor Maximum Dry Density(SPMDD). Place and compact to a minimum of 100% SPMDD, a minimum of 200mm (8") of granular sub base. The placement and compaction of additional fill required shall be in accordance with Division 2 of the specification. Ensure all under-floor services are installed and approved and trenches backfilled and compacted. Placing of concrete shall indicate that the contractor has found the sub base acceptable.
 - .4 All footings shall be placed on native undisturbed material capable of supporting the design bearing capacity shown on the drawing. A Soils Engineer may be required to verify the nature and capacity of the material prior to placing concrete. The elevation of the top of the native soil is shown on the foundation plan for general guidance and tender purposes only.
 - .5 Pour slabs over vapour barrier, which has been tapped and sealed along the edges. Use runways to protect vapour barrier from damage.
 - .6 Remove all water from footings and forms. Do not permit water to flow over concrete within 24 hours of placing.
 - .7 Notify Engineer at least 24 hours in advance of placing concrete to enable the reinforcement and inclusions to be reviewed. Do not close forms until reinforcement has been reviewed.
- 3.3 Reinforcement Bars And Wire Mesh**
- .1 Place reinforcement in strict accordance with requirements of Ontario Building Code, 1990 and RSIO Manual.
 - .2 Bars shall be free from scale, rust, grease, oil, clay, or other coating deleterious to bond. Bend bars cold in accordance with standard bending procedure. Bars with bends or kinks not specified may be rejected.
 - .3 Place reinforcement in exact location and secure in place by steel chairs, spacers, and wire ties. No masonry chairs will be permitted.
 - .4 Reinforcement specified as continuous shall be spliced a minimum of 30-bar diameters unless otherwise noted and securely wired.
 - .5 Unless otherwise noted, floor slabs, exterior slabs and other locations particularly shown shall be reinforced with wire mesh placed at 1.5"(40mm) from the top of the slab.
 - .6 Unless noted otherwise on the structural plans, all floor slabs shall be a minimum 100mm (4" thick)

- 3.4 Joints**
- .1 Pour floor panels alternately in checkerboard pattern as defined by control joints on ground floor plan. The area of each panel shall not exceed 250 sq. ft. with maximum dimension to be 18'-0". See Structural drawings for saw cut locations.
 - .2 At the Contractor's option pour slabs monolithically (except at expansion joints) and finish. As soon as the slabs are set firm enough to work on, but no longer than 20 hrs after placing, cut control joints with carborundum bladed saw to a depth of 1/4 the slab thickness. After the concrete has set and contraction cracks have appeared in the bottom of these control joints, but no sooner than fifteen days after pouring, fill joints up to the top with purpose made joint filler and level off flush with the surface of the concrete.
 - .3 All saw cut locations must be verified with flooring contractor to ensure joints align in brittle surface finishes such as vinyl or ceramic tile.
- 3.5 Concrete Placement**
- .1 Place concrete as close as possible to final location to avoid segregation and flowing. While placing concrete ensure all forms remain plumb and true. Do not place concrete during rain. Protect from physical damage for a minimum of seven days.
 - .2 Place in one continuous operation until clean keyed construction joint is reached. Thoroughly vibrate into old concrete to promote mixing. Where the break in pouring is greater than 1.5 hours place a keyed construction joint
 - .3 Thoroughly work concrete into voids using mechanical high frequency vibrators. Vibrate slabs at 2'-0"o.c.
 - .4 Place slabs in one monolithic thickness to correct levels and slope to drains as required or shown.
 - .5 Carefully examine concrete after stripping for unfilled areas and honeycombing. Honeycombing shall be chipped away and entire area filled with cement mortar after cleaning, water washing and roughening. Fill voids with cement mortar to neat, smooth area flush with finished surface.

- .6 At concrete floors or at concrete slabs being covered by flooring finish slabs as follows:
 - a) Inspect underfloor condition and approve arrangements made for floor finish. Install screeds, or other straight edges for perfect alignment of floors.
 - b) Rake concrete (see Slump) into place and compact with mechanical vibrator. Strike off level with previously set screeds.
 - c) Thoroughly float surface using 200 lbs. or heavier mechanical float. Continue process until voids are completely filled. Test surface with straight edge and eliminate high and low areas.
 - d) When floor has sufficiently hardened, bring to smooth, level, even surface by mechanical trowel, including areas covered with resilient flooring, porcelain flooring and carpet.
 - .7 Depress concrete slab at all areas where finished surface is to receive a topping as shown on drawings. Such surfaces need not be steel troweled.
 - .8 Protect concrete from premature drying, excessive temperatures and mechanical injury. Minimize loss of moisture following final finishing of concrete by immediately applying Sika "Florseal" or equal using a roller coater or low pressure spray in quantity as recommended by manufacturer. Ensure surface finish is compatible with the sealant before application.
 - .9 Supply, install and form concrete work indicated on mechanical and electrical drawings unless specifically called for in specifications for those trades.
 - .10 Concrete for Mechanical and Electrical Trades under Division 15 and 16.
 - .11 Set items furnished by others for building into concrete, include column plates, anchor bolts, etc.
 - .12 For application of concrete hardener, apply at an application rate of 5 kg/m².
- 3.6 Cold-Weather Concrete
- .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 50mm (2") to 75mm (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.

3.7 Field Quality Control

- .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Owner in accordance with CAN3-A23.1-M90.
- .2 Cost of testing will be paid from allowance in Section 01020 - Cash Allowances. Materials shall be supplied by the Contractor at no cost to the contract.
- .3 Non-destructive Methods for Testing Concrete shall be in accordance with CAN3-A23.2-M90.
- .4 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.
- .5 Three specimens shall be made for each strength test. Quantity of test for each class of concrete to conform to CSA CAN3-231. Specimens shall be moulded, stored and laboratory cured to conform to CSA-23.1.
- .6 During the placing of concrete under conditions of "Cold Weather Requirements", two additional specimens shall be made and shall be stored on the job site under conditions similar to the concrete it represents. These specimens shall be intended as a field control test and shall be cured to conform with CSA 3-23 1.14.3.5.3. These specimens shall be tested at 7 and 28 days respectively.

- .7 Slump shall be determined for each set of specimens to conform with CSA CAN3-23.1. When air entrained concrete is specified and air content shall be determined for each set of specimens to conform with CSA CAN3-23.1 and CSA CAN3-23.2.
- .8 Test Reports - Reports of results of the above test shall be made and copies distributed promptly to the Consultants by the Inspection and Testing Company as directed by the Architect. Reports shall include comment of abnormal conditions, explanation of any lack of strength indicated and location of the concrete is question. Designate whether specimens are laboratory or field cured.
- .9 Contractor shall pay for any further tests required for questionable concrete. These tests shall consist of one or more of the following procedures:
 - 1) Schmidt Percussion Hammer
 - 2) Tests to determine quantity or quality of cement
 - 3) Specimens cut out and tests using recognized methods of testing (CSA, A.A.T.M., or CSI).
 - 4) Load tests according to the requirements of the American Concrete Institute Code "Building Code Requirements for Reinforced Concrete (318)".
- .10 Correct any areas below specified values at not extra cost to Owner.
- .11 Owner reserves the right to reduce payment for any concrete below specified values which is allowed to remain in place subject to Architects approval.

3.8 Cleanup

Upon completion of the work of this section, the contractor shall clear the site of all tools equipment excess waste and debris resulting from the operations and leave the site in an acceptable condition.

END OF SECTION 03300

PART 1 - GENERAL

1.1 Description of Work

- .1 The work to be done under this section shall consist of the supply of all materials labour, supervision, plant and equipment to construct all miscellaneous metal items shown on the drawings and/or specified herein (metal support brackets, metal support legs, metal lintels, metal handrails, metal stair guards, metal running track guard, metal ballustrades and all similar items noted and/or shown on drawings).
- .2 Carefully examine all drawings and the site to determine the extent of the work. Ensure that all Drawings and Specification Sections, including those for structural, mechanical and electrical work, are consulted to establish the extent of work required for this Section.

1.2 Shop Drawings

- .1 Submit 5 (five) copies of Shop Drawings to the Architect for examination, giving complete information necessary for the fabrication of the various members and components of the stairs, including structural steel material specifications and the location, type and size of all bolts and welds. Distinguish clearly between shop and field bolts and welds.
- .2 All modifications and substitutions proposed by the Contractor must be submitted for approval to the Engineer for the structural adequacy. All modifications and substitutions must be shown on shop drawings for final approval.
- .3 Do not commence fabrication until final approval of the drawings is received.

1.3 Shop Painting

- .1 The steel shall be cleaned by shot blasting, scraping and abrading or wire brushing to remove all loose mill scale, rust, oil dirt and other foreign matter. Surfaces shall be completely dry before painting.
- .2 One coat of paint shall be applied in the shop unless noted on the drawings, conforming to CGS-G2-40D.
- .3 Surfaces which will be inaccessible after assembling shall be given two coats prior to assembly. Touch up all bolts, welds and surfaces of connecting members damaged during construction.
- .4 Areas to be embedded or encased in concrete, edges and surfaces adjacent to field welds and bolted connections, shall be left unpainted.

1.4 Storage and Handling

- .1 All materials shall be handled and stored at the site in a manner to avoid damage of any kind.
- .2 Materials damaged due to faulty storage or handling shall be repaired or replaced, without additional expense to the Owner, all to the satisfaction of the Architect.

PART 2 - PRODUCTS

2.1 Material

- .1 Lintels:
 - a) Steel of sizes shown on Lintel Schedules and Structural Drawings.
 - b) Provide concealed angle clips welded to lintels and anchored with bolts at lintel supports.
 - c) Finish: Prime and paint.
- .2 Miscellaneous Steel Items [Channels, Clips, Angles, Bar Stock, Plate Stock, Hollow Structural Steel and all other Shapes]: as required and/or as indicated to complete all work as part of this project.
- .3 Steel for lintel and structural steel plates shall be in accordance with C.S.A. specification G.40.21-44W.
- .4 Expanded Metal Mesh at Running Track Guard:
to be $\frac{3}{4}$ " opening [diamond-shape] #9 [9- gauge] Raised Surface plain steel expanded metal sheet stock in 4'-0" x 8'-0" sizes. Product to be as supplied by Duke's Wire Mesh or alternate supplier. Product to be cut to suit [related opening sizes] and tack-welded into famed opening sizes [as per drawings]. Final assembly to be paint-finished as per Specifications.

PART 3 - EXECUTION

3.1 Fabrication

- .1 Use welded joints throughout wherever practical. All welding shall conform to the requirements of the current edition of C.S.A. Standard W59 and the fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with the requirements of C.S.A. Standard W47. Wherever possible (without affecting integrity of the weld), grind welds smooth and flush on all miscellaneous metal items exposed to view during daily operations of the facility.
- .2 The seaming of built-up components shall be made with hairline joints in the least conspicuous location and manner. All work shall be assembled in the most substantial manner and reinforced where necessary with fastenings. All screws and forms of mechanical attachment shall be countersunk unless otherwise noted. Exposed surfaces of all metal components shall be smooth and free of irregularities.
- .3 Apply a coat of primer to all interior ferrous metals before leaving the shop unless noted otherwise. Touch up any areas damaged after erection.
- .4 All items shall be fabricated, finished and assembled in the shop as much as is possible, consistent with the size and shipping problems. Assembly on the jobsite and site-welding shall be kept to a minimum.

3.2 Anchors

- .1 Provide and install all anchors required for fastening miscellaneous metal items in concrete or masonry anchors shall be strap steel bent to shape, welded to backs of members with bent end for building facing inward. Sizes and spacing shall be as indicated but where not specially noted, they shall be not less than 38 x 4. mm (1-1/2" x 3/16") and spaced at not over 914mm (3'-0") c/c with minimum of 3 anchors per member.
- .2 For attaching work to masonry or concrete where anchors or insert cannot be built in, provide approved self-drilling anchors.

3.3 Installation

- .1 Install all work level, plumb and true throughout [unless noted otherwise].
- .2 Ensure continuity of finished assemblies when installed in components.
- .3 Ensure structural integrity of anchored components prior to leaving job site.

END OF SECTION 05500

PART 1 - GENERAL

- | | | | | |
|-----|----------------------------------|----|--|---------------|
| 1.1 | Description of Work | .1 | Including the following but not limited to: sheathing, furring, rough framing, grounds, blocking, rough hardware, wood preserving, concealed wood anchoring within stud wall assemblies for all metal door and glazing screen frames, concealed wood anchoring for all wall and/or ceiling mounted fitments, features and equipment items identified on the drawings, etc. | |
| | | .2 | Temporary carpentry, including fencing, hoarding, etc. as required throughout the course of construction to comply with all items in Division 1. | |
| 1.2 | Related Work Specified Elsewhere | .1 | Finish Carpentry | Section 06200 |
| | | .2 | Architectural Woodwork/Millwork | Section 06400 |
| 1.3 | Source Quality | .1 | Identify lumber by grade stamp of an agency certified Control by Canadian Lumber Standard Administration Board. | |
| | | .2 | Identify pressure treated wood by stamp of approval and Licensed applicator of Kopper's "Wolmanized" system. | |

PART 2 - PRODUCTS

- | | | | | |
|-----|--------|----|--|--|
| 2.1 | Lumber | .1 | Except as indicated or specified otherwise, lumber materials shall be softwood, not greater than 19% moisture content at time of installation, in accordance with the following standards:
(a) CSA 0141
(b) NLGA Standard Grading Rules for Canadian Lumber, effective 1979. | |
| | | .2 | Machine stress-rated lumber is acceptable for all purposes. | |
| | | .3 | Framing and board lumber; in accordance with Table 9.3.2A of O.B.C. 1990 except as indicated or specified otherwise. | |
| | | .4 | Plywood coping and sheathing: exterior grades thickness as shown. | |
| | | .5 | Preserved wood: pressure treated softwood, to CSA 080, using Wolman CCA preservative. | |
| | | .6 | Plywood: CSA 0151M - Softwood. | |

- 2.2 Fastenings and Hardware
- .1 Nails, spikes and staples.
 - (a) Use common spiral nails and spiral spikes except where indicated otherwise.
 - (b) Use hot galvanized finish steel for exterior work, pressure-preservative treated lumber except where indicated otherwise.
 - .2 Bolt, nut, washer, screw and pin type fasteners: with hot-dip galvanized finish for exterior work, interior highly humid areas and for pressure-preservative treated lumber; elsewhere with primer paint finish where installed on sight-exposed surfaces.
 - .3 Use surface fastenings of following types, except where specific type is indicated.
 - (a) To hollow masonry, plaster and panel surfaces use toggle bolt.
 - (b) To solid masonry and concrete use expansion shield with lag screw or lead plug with wood screw.
 - (c) To structural steel use bolts through drilled hole or welded stud-bolts or power driven self-drilling screws.

PART 3 - EXECUTION

- 3.1 Furring and Blocking
- .1 Install furring and/or solid wood blocking as required to support and/or to solidly anchor finishes, fitments, features, white boards and all wall and ceiling-mounted equipment items throughout. Use solid wood blocking within concealed wall, ceiling and/or bulkhead assemblies as required.
 - .2 Align and plumb face of furring and blocking to tolerance of 1:600.
 - .3 Ensure provision of continuous 2" wide x depth to suit wood blocking around all door frames in steel stud wall assemblies. Blocking depth to be full depth of steel studs surrounding door/glazing screen framing.
- 3.2 Rough Bucks
- .1 Install wood bucks and nailers as indicated and/ or where nailers required.
 - .2 Except where indicated otherwise use material at least 38mm thick secured with 9mm bolts located within 300mm from ends of members and uniformly spaced at not over 1200mm between.
 - .3 Countersink bolts where necessary to provide clearance for other work.

3.3 Coping, Curbs
and Sheathing

- .1 Install backing, curbs and other wood supports for roofing and sheet metal work, and roof mounted equipment, as indicated.
- .2 Secure with galvanized bolts where indicated, galvanized screws elsewhere. Locate fastenings within 300mm from ends and uniformly spaced between. Space bolts at 1200mm maximum and nails at 600mm centers maximum except where indicated otherwise.
- .3 Install wood nailers for roof hopper, dressed, tapered and recessed slightly below surface of roof insulation.

3.4 Electrical
Equipment
Blackboard

- .1 Provide backboards for mounting electrical equipment as indicated. Use 19mm thick poplar or fir face veneer CPS/SIS or DFP/GIS on 19 x 38mm furring around perimeter maximum 300mm intermediate spacing

END OF SECTION 06100

PART 1 - GENERAL

The work under this section consists of the following but is not limited to:

- | | | | | |
|-----|----------------------------------|----|--|---------------|
| 1.1 | Description | .1 | Installation of milled wood slat benches and wall-mounted shelves. | |
| | | .2 | Installation of architectural wood trimwork items identified on the drawings. | |
| | | .3 | Installation of white boards and tack boards. | |
| | | .4 | Installation of miscellaneous wood and/or millwork trim items as indicated on drawings. | |
| | | .5 | Installation of hollow metal door frames. | |
| | | .6 | Installation of hollow metal glazing screens. | |
| | | .7 | Hanging of hollow metal doors. | |
| | | .8 | Hanging of solid core wood doors. | |
| | | .9 | Installation of Finished Hardware supplied under Section 08710. | |
| 1.2 | Related Work Specified Elsewhere | .1 | Rough Carpentry | Section 06100 |
| | | .2 | Architectural Woodwork | Section 06400 |
| | | .3 | Steel Doors and Frames | Section 08100 |
| | | .4 | Wood Doors | Section 08210 |
| | | .5 | Finish Hardware | Section 08710 |
| | | .6 | Painting and Finishing | Section 09900 |
| | | .7 | White Boards and Tack Boards | Section 10120 |
| 1.3 | Reference Standards | .1 | Do millwork to millwork standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC). | |

- 1.4 Samples
- .1 Submit duplicate 300mm x 300mm samples of each type of panelling and each type of solid wood or plywood to receive paint finish, in accordance with Section 01340.
 - .2 Submit duplicate 300mm long samples of each type of trim moulding, in accordance with Section 01340.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Softwood Lumber: to CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content of 10%.
 - .2 Hardwood Lumber: to National Hardwood Lumber Association (NHLA) requirements; moisture content to AWMAC - premium grade; species, red oak or birch as indicated or scheduled.
 - .3 Stain-Finished or Clear-Finished Hardwood Trims: Grade 1 solid clear maple free of knots and/or fillers.
 - .4 Paint-Finish Hardwood Trims: Paint-grade solid poplar.
- 2.2 Trimwork
- .1 Mill wood components to dimensions and profiles indicated on the drawings.
 - .2 All faces to be machine dressed finish. All faces to be progressively sanded to smooth finish suited to the specified finish.

PART 3 - EXECUTION

- 3.1 Interior Trim
- .1 Standing and running trim to be AWMAC custom grade construction.
 - .2 Trim to be of species as detailed.
 - .3 Install all wood trims plumb, level and true throughout unless shown otherwise on design drawings. Seam all trims [where required] flush and true with adjacent trims, mitring and overlapping joints in single runs. Mitre joints at 90 degree corners unless noted otherwise.
 - .4 Fill all holes [from setting nails and related anchors] and other irregularities with appropriate wood filler finished flush and true to surrounding wood surfaces. Select wood filler type to ensure suitability to specified final finish [stain-finish vs. paint grade finish].

- 3.2 Erection
- .1 Set and secure materials and components in place, rigid, plumb, true and square.
 - .2 Join wood components together with a combination of carpenter's glue and mechanical fasteners as applicable.
 - .3 Provide heavy duty fixture attachments for wall mounted items. For trims, ensure use of construction adhesive [where applicable] to minimize requirements for exposed fasteners requiring filling.
 - .4 Provide solid and secure fastening of finish wood elements to rough blocking or other supporting material.
 - .5 Prepare external exposed and semi-exposed surfaces ready for painting.
 - .6 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.
- 3.3 Hardware
- .1 Install hinges, latches and pulls and specified hardware at wood doors. Install using templates supplied by Hardware consultant; hang wood doors in specified frames; adjust for smooth free movement, free of binding. Ensure that all doors are properly balanced to close and do not 'hang' open.
 - .2 Install latches, locks, striker plates, pulls, pushes, closers, panic devices, etc., in pre-fabricated openings in steel doors and frames.

END OF SECTION 06200

PART 1 - GENERAL

1.1 Description
of Work

The work shall consist of but not be limited to the following:

- .1 Supply and installation of shop-fabricated counters, countertops, cupboards, cabinetry, shelves, storage units, display cases, built-in millwork items, slatwall/slotwall displays, kneewall caps, trims, millwork wall panels etc. and all other similar and/or related millwork items shown on the Architectural drawings.
- .2 Supply and installation of all miscellaneous wood, melamine, and plastic laminate-faced trims and panelized wall treatments as shown on Architectural drawings.
- .3 Supply and installation of all hardware for Architectural millwork items [covered in this Section] is to be by Division 06400. This includes (without strict exception to) all hinges, drawer glides, cabinet knobs and pulls, cabinet catches/latches, cabinet locks at doors and drawers countertop grommets, cabinet leveling legs, countertop support legs, casters, coat rods, coat hooks, glass shelving, glass shelving support suspension systems, sliding glass doors and tracks, glass at glazed cabinet doors, cabinet glazing stops, shelf support pilasters, pilaster clips, shelf support pins
- .4 Supply and installation of countertops associated with millwork items in the specified materials [including those made of plastic laminate, solid surfacing, stainless steel, etc.] as specified on the Architectural drawings.
- .5 Installation only of all cabinetry hardware items associated with this Division.

1.2 Related Work
Specified
Elsewhere

- | | | |
|-----|----------------------------------|---------------|
| .1 | Rough Carpentry | Section 06100 |
| .2 | Finish Carpentry | Section 06200 |
| .3 | Sealant | Section 07900 |
| .4 | Finish Hardware | Section 08710 |
| .5 | Glass & Glazing | Section 08800 |
| .6 | Resilient Tile Flooring | Section 09660 |
| .7 | Painting | Section 09900 |
| .8 | White Boards and Tack Boards | Section 10120 |
| .9 | Steel Stud and Gypsum Board | Section 09111 |
| .10 | Mechanical | Section 15000 |
| .11 | Electrical | Section 16000 |
| .12 | Metal Fabrication (Misc. Metals) | Section 05500 |

- 1.3 Requirements of Regulatory Agencies .1 All finishes shall meet the flame spread and smoke development requirements of the Ontario Building Code for the specific location and application for all parts of the Work.
- 1.4 Prevailing Performance Standard .1 Notwithstanding information provided elsewhere herein, all millwork items supplied and/or installed by this Division are to be fabricated to the 'Custom Grade' standards outlined in the most current edition of the **Architectural Woodwork Manufacturers Association of Canada (AWMAC)** 'Architectural Woodwork Quality Standards' Guide prepared by the Architectural Woodwork Institute. This Guide is to be taken as the standard for fabrication of all items herein and shall be acknowledged by the Millwork Trade as a mandatory supplementary reference guide (in addition to this Specification) for the completion of all related work for this project.
- 1.5 Samples .1 Submit duplicate 300mm x 300mm samples of each type laminate, melamine and solid surfacing material specified herein for Architect's approval prior to product ordering. All samples shall fully conform to the colours and finishes specified.
- 1.6 Shop Drawings .1 Submit shop drawings in accordance with Section 01340.
.2 Clearly indicate details of construction, profiles, jointing fastening and other related details. All finishes to be noted respective to rooms and locations. Ensure that all millwork items bounding pieces of equipment are coordinated with actual equipment dimensions supplied by Owner.
- 1.7 Product Handling .1 Cover finished laminated plastic surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means.
.2 Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22°C (72°F).
- 1.8 Warranty .1 Contractor hereby warrants that laminated plastic work, solid surface countertops, stainless steel countertops and melamine finish items will not warp, crack or delaminate for two years from the date of Occupancy.

PART 2 - PRODUCTS

2.1 Materials

- .1 **Softwood Lumber:** to CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content of 6% for interior work. Pine species, to AWWAC custom grade for concealed framing.
- .2 **Hardwood Lumber:** to National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 6% for interior work. Maple species, to AWWAC custom grade for all solids as detailed, including nosing and edging. Mill worker to select only clear, regular grained pieces, free of all knots, warps, splits, sapwood streaks and any visible irregularities. The Architect reserves the right to refuse any pieces deemed unsatisfactory for replacement to his satisfaction at no cost increase.
- .3 **Hardwood Veneered Plywood:** to CSA 0115 in thicknesses indicated on drawings. Maple veneer on plywood core or on industrial grade particle board core having minimum 720 kg/m³ (45 lb/cu. ft.) density and meeting CAN30 018801 M78. Grade "R" Maple veneer, free of visible irregularities including knots, grain warbles, heavily contrasting grain patterns etc. The Architect reserves the right to reject any pieces deemed unsatisfactory for replacement to his satisfaction at no cost increase.
- .4 **Particle Board:** Laminated surfaces to have substrate of industrial grade particle board having minimum 720 kg/m² (45 lb/cu. ft) density and meeting CAN-3001881. Particle board thickness as noted on drawings.
- .5 **Medium Density Fiberboard (MDF):** MDF materials to conform to ANSI A208.2-2009 (Grade 155) with a density of 46 - 48 lbs/cubic ft. MDF thickness as noted on drawings. Product to be Uniboard Excel + Grade or approved alternate.

Where MDF is used in exterior applications and in interior applications subject to even infrequent water exposure, ensure use of Extirra water-resistant MDF throughout.

.6 PLASTIC LAMINATE FOR FLATWORK:**General Purpose Laminate:**

For cabinet bodies and general surfacing applications (excluding post-formed countertops) laminate to conform to CAN3 A172 M79, Grade standard GP (R) grade, 1.15 mm (1/64") thick throughout, with resin-impregnated kraft-paper core.

Post-Forming Grade Laminate:

Post-forming grade plastic laminate to be used only where post-formed countertops are indicated.

Plastic Laminate Colours & Finishes:**PLASTIC LAMINATE #1 [PL.LAM #1]:**

PRODUCT SPEC: ARBORITE #P-395 VL, ARCTIC ICE

FINISH: VELVATEX 'VL'

GEN. LOCATION: GENERAL COUNTERTOPS (WHERE SPECIFIED)

For any laminates not noted on the Architectural drawings, the Architect reserves the right to select any number of laminates for installation on millwork items at no cost increase. Acceptable manufacturers: Print Abet Laminati, Forbo Arborite, Formica, Nevamar, Pionite, Laminart and Wilsonart. The Architect reserves the right to select any of the available colours, patterns or finishes from the manufacturers' product range up to (and including) the value of Wilsonart premium finish patterned (non-metallic) laminates. Only the colours, patterns and finishes outlined on the Colour Schedule (and/or Architectural drawings) will be accepted. Necessary changes or substitutions other than those directly specified must be approved by the Architect prior to fabrication.

- .7** Plastic Laminate Adhesive: contact adhesive to CGSB 71-GP-10M, or as per respective manufacturer's specifications.

.8 MELAMINE PRODUCTS:

Melamine surfaces (melamine component panels) are to be used in locations where noted on Architect's drawings. Colours to be selected by Architect and as noted in the drawings. All melamine finished panels to be thermo-fused melamine resins (with specified photo paper) on particle board backing in thicknesses noted on drawings.

Melamine Finishes at Visible Exteriors:

For all visible and/or exposed melamine finishes (i.e. finishes at exterior cabinet faces and/or at interior cabinet faces visible through glass doors), acceptable products (in locations noted on Architectural drawings) to be:

MELAMINE #1 [MEL #1]:

MANUFACTURER: ON TREND
DISTRIBUTER: MERCURY WOOD PRODUCTS
COLOUR: RU-05 LARICE BIANCO
FINISH: RUSTICA
GEN. LOCATION: GENERAL CABINET BODIES
EDGEBANDING: MATCHING 1.0 mm THICK PVC EDGE-
BANDING AS SUPPLIED BY MERCURY
WOOD PRODUCTS
GRAIN DIRECTION: VERTICAL UNLESS NOTED OTHERWISE

NOTE for Melamine Grain Control:

- woodgrain orientation to be vertical on all door and drawer facings throughout (as illustrated on architectural drawings)
- ensure continuity of the grain on vertically stacked facing panels (i.e. between stacked drawers and/or doors) to ensure that finished installation appears to be cut from one consistent veneer [in conformance with AWMAC 'CUSTOM STANDARD' specified herein]

Melamine Finish at Concealed Interiors

Melamine surfaces at concealed cabinet interiors (i.e. concealed behind opaque cabinet doors and/or drawers) may be standard "Cabinet White" melamine throughout.

.9 MILLWORK EDGEBANDING:

All edgebanding to be as noted below for respective application. Edgebands are to be finished true and flush with adjacent surfaces throughout. Unless noted otherwise edgebanding to be:

a) Polyester Edgebanding at Concealed Melamine**Interiors:**

"Cabinet White" polyester tape to match adjacent finishes

b) PVC Edgebanding at Visible/Exposed Melamine Items:

At all exposed melamine cabinet edges, full perimeter of exposed shelves, drawer faces, cupboard doors, gables,, panelized wall cladding, melamine trims, etc. (and all similar items shown on drawings) are to be finished in PVC edgebanding to match panel faces throughout as noted below:

Edgebanding at MEL#1:

Manufacturer: On Trend by Mercury Wood Products

Colour: to match melamine #1

Finish/Texture: to match melamine #1

Thickness: 1.0 mm ABS/PVC

Width: to suit (23mm stock width)

ABS/PVC edgebanding on facing panels is to be supplied in over-sized widths and finished flush to adjacent melamine surfaces in shop by commercial grade edgebander.

Edgebanding to be applied to melamine boards in full accordance with edgeband manufacturer's specifications for recommended application, including all related materials, adhesives and execution techniques.

Ensure ABS/PVC edgebanding specified above is used below all millwork components in contact with floor (side gables, toekicks etc.) to provide optimal water-resistance. Continuous clear silicone sealant at junctures of millwork with resilient flooring finishes throughout.

Ensure that all shelves are finished with edgebanding on all 4 sides (typical throughout).

c) Edgebanding at Plastic Laminate Finishes:

Unless noted otherwise, edgebanding at plastic laminate items to be 'self edged' plastic laminate, horizontal grade material matching adjacent panels.

- .10 Nails and staples: to CSA B111, plain finish.
- .11 **CABINET DOOR AND DRAWER PULLS:**
Cabinet pulls to be Richelieu #613289-143, 5 5/16" long x 1" projection pulls in #143 'antique nickel' finish.
- .12 **Door Hinges at Cabinets:**
All hinges at melamine cabinet doors to be Blum 'Modul' series throughout, min. 107° opening at all standard cabinets (unless noted otherwise). 2 hinges (1 pair) per door minimum. Doors exceeding 2'-6" height shall have additional hinges to suit.
- .13 **Drawer Glides:**
All drawer glides to be side-mounted full extension ball-bearing glides, with a capacity of 75 lbs per pair. Acceptable products include Accuride 2632 series as supplied by Richelieu or approved alternate.
- .14 **Millwork Locks:**
All millwork locks for drawers & cabinet doors to be chrome plated, disk tumbler lock with removable cam core; provide 3 keys per lock. Coordinate final selection of lock type to ensure mounting compatibility with specified door and drawer materials. Lock locations to be as indicated on drawings.
- .15 **Pilaster Strips:** Pilaster Strips at adjustable shelves to be clear aluminum throughout complete with aluminum support clips, 4 per shelf. Provide extra stock of clips to the quantity of 1 clip per shelf. All pilaster strips to be installed flush (recessed) with adjacent surfaces throughout.
- .16 **Garment Hooks:**
All garment hooks [in and related to millwork items] to be Hafele #845.12.809 double coat hook in polished aluminum finish, in quantities and locations shown thereon.
- .17 Caulking/sealants for interior use in accordance with Section 07900.
- .18 Paints, stains, and clear topcoats: see Section 09900.
- .19 **Coat Rods:**
Coat rods to be 1.25" diameter chrome-plated steel tube commercial coat rods with matching chrome-plated steel anchoring collars to suit. Single piece coat rods throughout in lengths cut to suit required dimensions. Expandable coat rods with integral anchoring collars will not be accepted.

PART 3 - EXECUTION

- 3.1 Fabrication of Cabinetwork
- .1 Fabricate caseworks to **AWMAC** conventions and standards for 'Custom Grade' construction as noted in Part 1 herein.
 - .2 Site measure rooms and spaces to verify/obtain governing dimensions before fabricating millwork items, particularly those between architectural openings and those accommodating equipment or fixturing (supplied by others). Millwork trade is to verify the size of all related fixtures and equipment items prior to fabrication.
 - .3 Report all dimensional discrepancies between the drawings and subsequent site conditions to the Architect for input prior to fabrication.
 - .4 Fabricate all product to the dimensions, material and details shown on the drawings.
 - .5 Finish all edgebanding flush and true to surrounding millwork faces, easing edges slightly to remove sharpness of outside edges.
 - .6 Countersink all nails and apply plain wood filler to indentations, finishing it smooth and ready to receive finish. Touch up all filled fasteners to match surrounding finish.
 - .7 Shop install cabinet hardware for doors, shelves and drawers. Recess pilaster strips for adjustable shelves throughout [unless noted otherwise].
 - .8 Ensure that all millwork cabinet facings, trims and panelized wall cladding is installed flush, plumb and true throughout. Cabinet facings to be adjusted as required to ensure correct operation of doors and drawers, with consistent, straight and aligned gaps between doors, drawers and filler strips throughout.
 - .9 Provide cutouts for plumbing fixtures, electrical pass-throughs and all related items to be accommodated.
 - .10 Provide concealed wood support members (or substrate products) below rigid countertop materials to prevent countertop cracking under heavy load during use.
- 3.3 Fabrication of Pl. Laminate Work
- .1 Comply with CAN3-A172-M79, Appendix 'A'.
 - .2 Ensure adjacent parts of continuous laminate facings or abutting laminate facings match in colour and pattern.
 - .3 Laminates with a directional pattern (wood grains or patterned designs) to be oriented as per Architect's instructions. Fabricator to clarify related uncertainties with Architect prior to fabrication.

- .4 Bond plastic laminate to core material in accordance with manufacturer's instructions for the intended application. Ensure that core and laminate materials contact uniformly throughout to ensure 100% bond over entire surface. Use continuous laminate lengths up to 3000mm (10').
 - .5 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material as indicated. Do not mitre laminate edges.
 - .6 Install work plumb, true and square, neatly scribed to adjoining surfaces.
 - .7 Backsplashes and countertops to be post-formed only where shown on drawings. Post-formed countertops to have integral backsplashes only where shown on drawings. Backsplash heights to be 3" above countertop level (typical). Countertops to have post-formed bullnose edging types as shown on drawings, and projecting 1 1/2" beyond face of adjacent cabinets below (typical). Only those bullnose types shown on the Architectural drawings will be accepted.
- 3.3 Fabrication of Solid Surfacing Countertops & Panels
- .1 All solid surfacing countertop are to be fabricated in full accordance with the product manufacturer's fabrication guide (and related requirements therein) respective to the intended application. Particular attention should be paid to:
 - provision of proper supporting substrates throughout
 - provision of matching solid surfacing seam blocks at all joints in material
 - provision of radiused inside blocks at all inside countertop corners
 - provision of gaps between solid surface material and substrate to provide adequate allowance for thermal expansion and contraction, including use of manufacturer-recommended adhesives
 - .2 All 'L-shaped' solid surface countertops must not be seamed on a 45° angle, but rather on an 'L-shaped' joint, with a min. 1" radius plus a 1" straight run at the inside corner, ensuring a 90° joint between adjacent surfaces. Consult manufacturer's fabrication guide for full requirements.
 - .3 Ensure provision of adequate support below all countertop cut-outs, and use of thermal isolation tape at any cut outs to accommodate heat generating equipment items.
 - .4 Ensure that all joints in solid surface materials are chemically welded with manufacturer-recommended colour-matching seaming adhesive. All joint seams are to be sanded and buffed smooth and co-planar throughout, free of perceptible lines and distinction between adjacent surfaces when complete.

- .5 All solid surfacing used as wall and/or bulkhead facing are to be adhered to full plywood substrates in full accordance with the manufacturer's recommendations for the intended application, utilizing recommended products and techniques.
 - .6 Solid surfacing materials are to be left in natural 'matt' finish throughout and are not to be buffed to a higher sheen.
- 3.4 Cabinetry Installation
- .1 Set and secure all materials and components in place ensuring that they are, plumb, true and square.
 - .2 Provide heavy-duty mechanical attachment for wall-mounted items and cabinets.
 - .3 Apply bitumous water-resistant coating over wood framing members in contact with masonry or cementitious construction subject to moisture.
 - .4 After installation, fit and adjust operating hardware for cabinet doors, drawers and shelves to ensure operation.
 - .5 Make allowances around perimeter where fixed objects pass through or project into work to permit normal movement without restriction.
 - .6 Provide cutouts for inserts, appliances, outlets boxes and penetrations. Round internal corners, chamfer edges and seal exposed core.
 - .7 Scribe all materials neatly and tight to surrounding walls and related architectural features free of gaps and irregularities.
 - .8 At junction of millwork items and adjacent walls (including around projections) apply a small continuous bead of sealant in accordance with Section 07900. Sealant/caulking colour to match adjacent wall surface.
 - .9 Setting Agents at Solid Surface Countertops:
All solid surface countertops are to be adhered to substrates with dabs of clear silicone in full accordance with the manufacturer's recommendations. No rigid adhesive setting agents may be used unless specifically recommended by solid surfacing manufacturer.
 - .10 Handling, storing, cutting, finishing and fastening of all compact laminate panels are to be in full accordance with manufacturer's recommendations throughout.
 - .11 Install all cabinetry hardware items specified herein in full accordance with the manufacturer's recommendations for the intended application. Ensure that all hardware is firmly anchored and performing correctly, adjusting as required to suit. Ensure that all cabinetry facing hardware is adjusting to provide plum and level facing panels, with consistent gapping throughout.

- 3.4 Trimwork Installation .1 Set and secure all materials and components in place ensuring that they are plumb, true and square unless noted otherwise.
- .2 All seams between adjacent trims in continuous run are to be mitred and overlapped. Glue and mechanically fasten joints to suit, filling and finishing to match specified trim finish. Ensure finished joints are flush and co-planar, free of gaps and visual irregularities.
- .3 Joints at 90 degree corners are to be mitred to suit, unless otherwise noted. Ensure finished joints are flush and co-planar, free of gaps and visual irregularities.
- 3.4 Millwork Wall Panel Installation .1 Set and secure all materials and components in place, ensuring that they are plumb, true and square unless noted otherwise.
- .2 Ensure that finished recessed face of all reveals behind decorative/millwork wall panels are fully finished to match panel facings unless noted otherwise.
- .3 Install all millwork wall panels/panelized wall cladding true, plumb and square unless noted otherwise utilizing concealed fastening techniques including adhesion to applicable substrates with permanent construction adhesive offering high initial tack. Temporarily brace all panels as required following initial setting to maintain position. Remove bracing only after adhesives are securely set and fully cured.

END OF SECTION 06400

PART 1 - GENERAL

- | | | | |
|-----|---------------------------------|----|---|
| 1.1 | General | .1 | Division One, General Requirements, is part of this Section and shall apply as if repeated here. |
| 1.2 | Description of Work | .1 | Provide all labour, materials, and equipment required or called for in this specification, and as shown on the drawings or which is necessary, to complete the work without any extra cost. This work may require any or all, but not limited to any of the following: |
| | | .2 | The supply and installation of a waterproofing membrane, applied to the exterior of the Elevator pit. |
| | | .3 | Work to include preparation of all substrates to a condition acceptable for the installation of the waterproofing membrane, installation of the waterproofing membrane system and detailing of all interruptions in and penetrations through the waterproofing plane around the elevator pit. |
| 1.3 | Relate Work | .1 | Excavation, Backfill, and Compaction Section 312310 |
| | | .2 | Cast-in-Place Concrete Section 03300 |
| 1.4 | Submittals | .1 | Upon request, submit certified copy of test data confirming performance requirements of waterproofing membrane specified in Section 2.2.1. |
| | | .2 | Submit appropriately sized samples of waterproofing membrane, 305mm x 305mm (12" x 12") for verification of compliance with material specified in Section 2.2.1. |
| 1.5 | Quality Assurance | .1 | All waterproofing membrane and accessories shall be applied by a professional Contractor who has placed similar materials. |
| 1.6 | Delivery, Storage, and Handling | .1 | Deliver all waterproofing membrane and accessory materials to the project site in original and unopened packaging with manufacturer's labels intact. |
| | | .2 | Waterproofing membrane and accessory materials shall be stored on site in such a manner so as to protect them from precipitation and ground moisture. Raised platforms and waterproof coverings shall be used where necessary. |

- .3 All materials including: Membrane, Sealants, Mastics, Liquid Membrane and Primer, shall be stored at temperatures no less than 4°C (40°F) and no greater than 32°C (90°F). Consult precautionary statements on product labels before use. Condition Liquid Membrane and Mastic to at least 16°C (60°F) prior to using.
- .4 Pallets of waterproofing membrane shall not be double stacked.
- 1.7 Job Conditions
 - .1 The waterproofing membrane and accessory materials shall be applied at temperatures satisfactory to the manufacturer and under dry conditions.
 - .2 Concrete shall be cured a minimum of 7 days and be free of surface moisture prior to the installation of the waterproofing membrane. Lightweight structural concrete must dry for 14 days. Allow a minimum of 24 hours following precipitation to provide for adequate drying.
 - .3 Prior to installation, the Contractor shall inspect those areas to receive the waterproofing membrane to ensure that they are clean, dry, sound and smooth.
- 1.8 References .1
 - .1 Proceed with the installation of the waterproofing system in accordance with any and all codes and standards of practice governing work of the nature described herein.

PART 2 - PRODUCTS

- 2.1 Manufacturer .1
 - .1 The waterproof system as described herein shall be as manufactured by WR Meadows of Canada Ltd. For information pertaining to this specification, contact WR Meadows of Canada, Milton, Ontario, phone (416) 878-4122 or Fax (416) 878-4125 or approved equivalent.
- 2.2 Materials .1
 - .1 Waterproofing membrane: SEALTIGHT MEL-GARD, composite of a polymeric membrane integrally bonded to a weather coated, asphalt-saturated protection course layer. It is protected on the membrane side as well with an easy to remove plastic release liner. Membrane, maintaining a minimum thickness of 2.23mm (88 mils), shall be provided in rolls of dimension 1.219m x 15.24m (3.9' x 50').

- .2 Primer: MEL-PRIME Solvent-Base Primer, dispersed in solvent, designed to provide good initial adhesion of membrane. Primer is dark red when wet and dries to a lighter shade. Packaged in 19 litre (5 US gal) pails.
Primer: MEL-PRIME Water-Base Primer, dispersed in water, designed to provide good initial adhesion of membrane at a temperature above 4.4°C (40°F). Primer is pink when wet and dries with a pink tinge. Packaged in 19 litre (5 US gal) pails.
- .3 Liquid Membrane: MEL-ROL Liquid Membrane, 2 component high performance sealant, 100% solids in content. Packaged in 3.8 litre (1 US Gal) units for application by trowel or bulk loading caulking gun.
- .4 Mastic: MEL-ROL Mastic, single component sealant. Packaged in 857 ml (29oz.) caulking tubes and 19 litre (5 US Gal) pails.

PART 3 - EXECUTION

- 3.1 General
 - .1 Examine all areas to receive the MEL-GARD Membrane to ensure that they are suitably prepared for its installation. Have deficiencies addressed prior to commencement of the installation.
 - .2 Concrete surfaces shall be smooth, clean, dry and free of any foreign matter that would otherwise hinder either the adhesion or regularity of MEL-GARD installation.
 - .3 The MEL-GARD Membrane and Accessory Products shall be installed only in suitable weather where air and surface temperatures are above -4°C (25°F), 4.4°C (40°F) if MEL-PRIME Water Base Primer is employed and there is no threat of precipitation. Do not apply to frost covered surfaces.
- 3.2 Preparation
 - .1 PRIMING
 - i) Prime concrete surfaces using a MEL-PRIME Primer, applied by means of roller or spray and at the rate recommended for the primer chosen. Coverage will vary with surface porosity.
 - ii) Allow primer to dry until tack free before proceeding with the membrane installation. Avoid pooling of the primer as well as over priming.

Preparation (Cont'd)

iii) To avoid excess pick up of airborne dust once priming has been completed, prime only as much area as can be covered with MEL-GARD Membrane the same working day. If not covered in the same working day, re-prime.

iv) Metal or other dense surfaces need not be primed, but should however be free of; grease, oil, dirt, loose paint, rust or any other contaminants.

.2 CRACK TREATMENT

i) Over all non working cracks or joints up to a maximum of 1.6mm (1/16"), apply a reinforcing strip of MEL-GARD not less than 225mm (9") in width centered over the crack.

ii) In the case of non working cracks or joints greater than 1.6mm (1/16") in width, it should be brought to the attention of the design authority that this condition exists. If deemed acceptable these cracks should be filled flush to the level of the surrounding surface prior to the placement of a 225mm (9") reinforcing strip, use MEL-ROL Liquid Membrane for this purpose.

.3 JOINTS

i) MEL-GARD Membrane is not in itself an expansion joint system, rather the membrane should be terminated at and tied in to a recognized expansion joint assembly. For additional assistance, contact your local WR Meadow representative.

ii) Cold pour joints should be treated in the same manner as non working joints (less than 1.6mm (1/16") in width), that is, following any grinding or chipping which may be required to smoothen the joint area, a reinforcing strip shall be centered over the joint prior to the field membrane application.

.4 DETAILING

i) It is recommended that a fillet of MEL-ROL Liquid Membrane be placed in all inside corners of vertical applications prior to covering the membrane. A fillet of Liquid Membrane and a reinforcing strip 304mm (12") wide are recommended at the footing/wall juncture in vertical applications and at the slab/wall juncture in horizontal applications.

3.2 Preparation (Cont'd)

- i) All drains and other protrusions should be sealed with 2 layers of membrane applied at least 150mm (6") in all directions. Around drains, apply a bead of MEL-ROL Mastic between the membrane and clamping rings.
- ii) Dowelling, conduits, equipment supports, etc. which penetrate the membrane should also be sealed by an applications of MEL-ROL Liquid Membrane.
- iii) All end laps in the membrane application as well as file cuts, shall be over coated using MEL-ROL Mastic or MEL-ROL Liquid Membrane at least 3.2mm (1/8") thick and 25mm (1") wide.
- iv) During final inspection of the in place membrane, conduct repairs as necessary. Reinforce damaged or questionable areas by means of an additional ply of MEL-GARD Membrane, appropriately sized to extend a minimum of 150mm (6") in all directions from the perimeter of the affected area.

3.3 Membrane Installation .1**HORIZONTAL APPLICATIONS**

- i) Positive slope to drain is regarded as a good design practice and as such should be provided. Membrane installation should then commence at the low point of all slopes and proceed to the high point.
- ii) Provide a chalk line or alternate means of establishing a square start location. Align first sheet with straight edge by removing the first few feet of release paper from the roll and laying membrane in place. Continue to pull release paper from roll thereby dispensing the membrane onto the deck. Proceed at a rate that allows for the ability to broom out any entrapped air from beneath the membrane as the roll proceeds.
- iii) Continue with subsequent rolls, aligning each with the previous maintaining a minimum overlap of 75mm (3"). For ultimate protection, as would be required for flood testing, place a bead of MEL-ROL Mastic in the center of each areas to be overlapped.
- iv) End laps as encountered at roll ends and splices should overlap the previous membrane sheet a minimum of 150mm (6"). Stagger all end laps. Apply Mastic at all "T" Joints.
- v) Lay membrane carefully to ensure a uniform applications and to minimize wrinkles/fish mouths.

**3.3 Membrane Insulation
(Cont'd)**

- vii) Immediately following placement, roll the membrane in its entirety to ensure continuous adhesion to the deck. The roller should be approximately 760mm (30") in width and 68 kg (150 lbs in weight). Wrap the roller with carpeting to allow the roller to conform to the slight irregularities of the surface, ensuring complete adhesion.
- viii) Do not allow membrane to pick up any dirt or foreign material as it is being installed.

.2 VERTICAL APPLICATIONS

- i) Cut MEL-GARD into lengths required to extend from the face of the footing and up the wall to the final grade elevation. Cut with a sharp knife prior to removal of release paper.
- ii) Provide a chalk line or alternate means of establishing a square start location. Align the first strip with the straight edge by removing the first few feet of release paper and putting membrane in place gradually. Proceed at a rate that allows hand smoothing for a wrinkle free application with not entrapped air bubbles.
- iii) Continue with subsequent strips aligning each with the previous maintaining a minimum overlap of 75mm (").
- iv) Do not allow membrane to pick up any dirt or foreign materials as it is being installed.
- v) End laps as encountered at roll ends and splices should overlap the previous membrane sheet a minimum of 150mm (6"). Stagger all end laps.
- vi) Immediately following placement press roll the membrane in its entirety to ensure continuous adhesion to the wall surface using a hand-held, multi-roll, tile roller or equivalent.

3.4 Inspect and Repair**.1**

Inspect and repair immediately before covering. Tears and inadequate overlaps should be covered with MEL-GARD Membrane slit fish mouths and patch. Seal patch edges with MEL-ROL Mastic. Where possible, horizontal applications should be flood tested for 24 hours. All leaks to be marked and repaired when membrane dries.

- 3.5 Membrane Protection .1 Backfilling should be done immediately using care and caution to avoid damaging the waterproofing application. Compaction of a maximum of 450mm (18") at a time is recommended.
- .2 Place selected cover, ie: landscaping, interlocking pavers, etc. over horizontal applications as soon as possible - do not leave exposed to the elements for more than 48 hours.

End of Section 07100

PART 1 - GENERAL

- 1.1 General Division One, General Requirements, is part of this section and shall apply as if repeated here.
- 1.2 Description of Work Provide all labour, materials, and equipment required or called for in this specification, and as shown on drawings or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to any of the following:
- .1 Firestop and smoke seal at:
 - i) Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - ii) Top of fire-resistance rated masonry and gypsum board partitions.
 - iii) Intersection of fire-resistance rated masonry and gypsum board partitions.
 - iv) Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - v) Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
 - vi) Openings and sleeves installed for future use through fire separations.
 - vii) Around mechanical and electrical assemblies penetrating fire separations.
 - viii) Rigid ducts: greater than 129 cm²: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
- 1.3 Related Work .1 Fire stopping and smoke seals within mechanical assemblies (ie. Inside ducts, dampers) and electrical assemblies (ie. Inside cable trays) are specified in Division 15 and 16 respectively.
- 1.4 References .1 CAN4-S115-M85, Standard Method of Fire Tests of Firestop Systems.
- 1.5 Samples .1 Submit samples in accordance with General Conditions.

PART 2 - PRODUCTS

2.1 Materials

- .1 Fire stopping and smoke seal systems: in accordance with CAN4-S115.
 - i) Asbestos-free materials and systems 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 and conforming to special requirements specified in 3.5.
 - ii) Firestop system rating: 2hr & 1hr.
 - iii) Fire Rated Joints for Concrete Steel Fluted Decks to Concrete Walls Assemblies using TREMstop Acrylic. This detail is to be used for **all** rated walls throughout scope of project.
- .2 Service penetration assemblies: certified by ULC in accordance with CAN4-S115 and listed in ULC Guide NO. 40 U19.
- .3 Service penetration firestop components: certified by UIC in accordance with CAN4-S115 M85.
- .4 Fire-resistance rating of installed fire stopping assembly not less than the fire-resistance rating of surrounding floor and wall assembly.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.
- .11 Acceptable material: Tremco, "TREMstop Acrylic".

PART 3 - EXECUTION

- 3.1 Preparation**
- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
 - .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
 - .3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
 - .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.
- 3.2 Installation**
- .1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
 - .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
 - .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
 - .4 Tool or trowel exposed surfaces to a neat finish.
 - .5 Remove excess compound promptly as work progresses and upon completion.
- 3.3 Inspection**
- .1 Notify consultant when ready for inspection and prior to concealing or enclosing fire-stopping materials and service penetration assemblies.
- 3.4 Clean Up**
- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
 - .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION 07270

PART 1 - GENERAL

- 1.1 General** Division One, General Requirements, is part of this section and shall apply as if repeated here.
- 1.2 Description of Work** Provide all labour, materials, and equipment required or called for in this specification, or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to any of the following:
- .1 Work of this Section shall include design, fabrication, supply and installation of all exterior, interior and soffits and canopies as applicable aluminum composite panels for building.
 - .2 Supply and installation of ACP system subgirts.
 - .3 Supply and installation of Tyvek commercial grade air barrier.
 - .4 Supply and installation of 13 mm (1/2") Dens Glass Gold sheathing. or exterior marine grade plywood.
- 1.3 Related Work**
- .1 Steel Stud framing: Section 09111
 - .2 Structural steel: Section 05120
 - .3 Exterior sheathing or plywood: Section 06100
- 1.4 Quality Assurance**
- .1 Supplier/installer shall have minimum 15 years proven experience and must have completed at least 5 major projects (projects of equivalent or greater value) in the specified aluminum composite material panel system.
- 1.5 Design and Performance Requirements**
- .1 Design, fabricate and erect a pressure equalized wall panel system to meet the following requirements.
 - a) Rain Penetration: prevent rain penetration through wall system. Design system based on "Rain Screen Principle". Incorporate means of draining to the exterior.
 - b) Wind Load: Design wall systems to resist wind loads, positive and negative, expected in this geographical region (OBC climatic data, 30 years probability) with maximum deflection of 1/180 of span and without causing rattling, vibration or excessive deflection of panels, overstressing of fasteners, clips and other detrimental effects on system.

1.5 Design and Performance Requirements (Cont'd)

- .c) Structural and Thermal Movement: Accommodate movement of supporting structural framing and movement caused by thermal expansion and contraction of system component parts without causing bowing, buckling, delamination, oil canning, failure of joint seals, excessive stress on fasteners or any other detrimental effects.
- .2 Panel flatness tolerance: Fabricate panels not exceeding the following tolerances:
 - a) Rises and falls across panel, (local bumps and depressions) will not be accepted.
 - b) 080" (2mm) in a concave/convex direction, measured perpendicular to normal plane.
- .3 Panel removal: System/procedure to allow removal of individual panels within wall system.
- .4 Maximum deviation from vertical and horizontal alignment of erected panels: 1/4" in 20'-0" (6mm in 6m).
- .5 Testing: Provide wall assembly that has been tested and certified to conform to the following criteria:
 - .1 Air Leakage: Not more than 0.006 (cfm)/sf of wall area (.003(L/s) m², when tested at 6.24 psf (300 Pa) in accordance with ASTM E283.
 - .2 Water Penetration: No water infiltration under static pressure when tested in accordance with ASTM E331 at a pressure level of 14.61 psf (700 kPa) minimum, after 15 minutes.
 - a) Water penetration is defined as the appearance of uncontrolled water in the wall.
 - b) Wall design shall feature provisions to drain to the exterior face of the wall any leakage of water at joints and any condensation that may occur within the construction.
 - .3 Structural: Provide systems that have been tested in accordance with ASTM E330 at a design pressure of 65 psf (3.12 kPa) and have been certified to be without permanent deformation or failures of structural members.

- | | | | |
|------|--|----|--|
| 1.6 | Samples | .1 | Submit samples in accordance with Section 01340. |
| | | .2 | Submit duplicate, minimum 5" x 7" samples of each colour selected. |
| 1.7 | Shop Drawings | .1 | Submit shop drawings in accordance with Section 01340. |
| | | .2 | Indicate elevations, profiles, dimensions and thickness of panels and joint details. |
| | | .3 | Indicate attachment clips, system extrusions, fastening, anchor and installation details. |
| 1.8 | Maintenance Data | .1 | Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual. |
| 1.9 | Mock-up | .1 | Submit mock-up in accordance with Section 01340. |
| | | .2 | Erect mock-up panel approximately 10' long x 10' high in location as directed by Engineer. |
| | | .3 | Mock-up panel shall include all components of the wall system and will be incorporated into work once approved. |
| 1.10 | Product Delivery, Handling and Storage | .1 | Protect panel face with a plastic film adhered to panel in accordance with panel manufacturer's recommendation. |
| | | .2 | Store components and materials in accordance with panel manufacturer's recommendations. |
| 1.11 | Kynar Panel Finish Warranty | .1 | Provide a manufacturer's written warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish on composite metal panels within the warranty period; warrant finish per ASTM D 4214 for chalk not in excess of 8 NBS units and fade not in excess of 5 NBS units. Warranty period for finish; 10 years after the date of substantial completion. |
| 1.12 | Material and Workmanship Warranty | .1 | Warranty against defects or deficiencies shall be for a period of one year from date of substantial completion |

PART 2 - PRODUCTS

2.1 Panels

.1 Aluminum Composite Panels (ACP):

- .1 Composition: Two sheets of aluminum sandwiching a core of extruded thermoplastic, formed in a continuous process without the use of glues or adhesives between dissimilar materials. Bond integrity testing to adhere to ASTM D1781-76.
- .2 Aluminum face sheets: aluminum alloy 3003, thickness: 0.020" (0.51mm)
- .3 Panel thickness: 4mm (.157")
- .4 Panel weight: 1.12 lbs/sq. ft. (5.5 kg/sq. m.)
- .5 Tolerances:
 - a) Panel bow: Maximum 0.8% of panel dimension (width or length).
 - b) Panel Dimensions: Take site measurements before proceeding with production unless dimensions can be guaranteed by General Contractor.
 - c) Panel lines, breaks and angles to be sharp and true; panel surfaces to be free from warp or buckle.
- .6 Panel System: Dry joint SL-2000 with 0.5" (12.5mm) wide panel joints using proprietary aluminum extrusions.
- .7 Acceptable material and manufacturer:
 - .1 Alucobond supplied by Sobotec Ltd., 67 Burford Rd., Hamilton Ontario, L8E 3C6 Tel. (905) 578-1278 or approved equivalent prior to close of Tender
- .8 **Panel Sizes & Shapes:**

Panel sizes & shapes to be as shown on the Architectural drawings throughout. Note positions of panel joints relative to alignment with adjacent architectural features as shown on Elevations and related drawings. Panel supplier to site measure prior to fabrication to verify dimensions and panel joint locations where shown.

Specialty panel shapes and profiles to be as per Architectural drawings.

2.1 Panels (Cont'd) .2 **PANEL FINISHES AND COLOURS:****Finish:**

Kynar, two/three coat, coil-coated baked enamel finish containing Kynar 500 or Hylar 5000 polyvinylidene fluoride resins.

Colour:

JLR Grey Metallic [Classic Collection]

.3 Panel and Wall Accessories:

- .1 Provide proprietary aluminum extrusions to manufacturer's standard profiles for a complete installation.
- .2 Fasteners: as recommended by the panel manufacturer, concealed and non-corrosive.
- .3 Extrusions and extrusion clips for attaching panels to the sub-structure: purpose made aluminum. Extrusions shall be full length around panel perimeter for panel reinforcement and alignment. Intermittent clips are unacceptable.
- .4 Plastic shims, shall be used as thermal separator between extrusions and sub-girts.
- .5 Sub-girts: To be manufactured from G-90 galvanized steel and shall be designed to accommodate expansion and contraction, dynamic movements and design load requirements.
- .6 Joint filler strip: same material and colour as panels. Use of caulking at joints is not acceptable.
- .7 Air Barrier shall be Tyvek Commercial Wrap, ASTM E 1677.
- .8 Exterior sheathing shall be ½" (13mm) thk. exterior grade marine plywood, as required to ensure fastening throughout.

PART 3 - EXECUTION

3.1 Wall Panel System

- .1 Before proceeding, examine work of other sections upon which this section depends.
- .2 Install subgirts/spaces straight and true all to support the work.
- .3 Install the 13mm (1/2") Dens Glass Gold sheathing as per manufacturer's instructions.
- .4 Install the air barrier, Tyvek Commercial Wrap over the entire face of the sheathing. Tape joints with compatible Tyvek product.

- .5 Erect panels and joint filler strip in accordance with system manufacturer's details and instructions and so as to meet specified design criteria and performance.
 - .6 Finished work shall be securely anchored, free of distortion and surface imperfections, uniform in colour.
 - .7 Use concealed fastenings only.
 - .8 Install panels plumb, true, level and in alignment to established lines and elevations.
- 3.2 Clean-up
- .1 Remove protective film from panels.
 - .2 Repair and touch-up with colour matching high grade enamel minor surface damage.
 - .3 Replace damaged panels and components which cannot be satisfactorily repaired.

END OF SECTION 07420

PART 1 - GENERAL

- 1.1 General** Division One, General Requirements, is part of this section and shall apply as is repeated here.
- 1.2 Description of Work** Provide all labour, materials, and equipment required or called for in this specification, and as shown on the drawings or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to any of the following:
- .1 Prefinished metal siding [in types as specified herein] including all exterior-grade z girts, starter strips, inside and outside corners, edging, drips, caps, flashings, trims, sealants, etc. as required for a complete installation.
 - .2 Prefinished metal soffit [in types as specified herein] including all exterior-grade furring strips, starter strips, inside and outside corners, edging, drips, caps, flashings, trims, sealants, etc. as required for a complete installation.
- 1.3 Standards and Design Criteria** Design cladding system in accordance with:
- .1 Canadian Sheet Steel Building Institute Standards.
 - .2 National Building Code of Canada
 - .3 Deflection of the cladding system is not to exceed 1/180th of the span for the specified dead loads, wind and suction forces acting on it.
 - .4 Design expansion joints to accommodate movement in cladding and between cladding and structure, to prevent permanent distortion or damage to the cladding.
 - .5 Design wall system to maintain the following erection tolerances:
 - a) Maximum variation from plane or location shown on shop drawings: 20mm/10m (3/4 inch/30 feet).
 - b) Maximum offset from true alignment between two adjacent members abutting end to in line: 1.00mm (0.04 inches).
- 1.4 Related Work**
- .1 Rough Carpentry Section 06100
 - .2 Prefinished Metal Flashing & Sheet Metal Section 07620
 - .3 Air/Vapour Barrier Membrane & Insulation Section 04220
- 1.5 References**
- .1 CSA B35.3-1962 Tapping and Drive Screws Slotted and Recessed head, Thread Forming and Thread Cutting Screws, and Metallic Drive Screws.
 - .2 CGSB 93-GP-4M-78 Siding, Soffits and Fascia, Steel, Galvanized, Prefinished.

- 1.6 Samples**
- .1 Submit samples in accordance with Section 01340 - Submittals.
 - .2 Submit duplicate 300 x 300 mm samples of siding material, colour and profile to be selected by Architect.
- 1.7 Quality Assurance and Substitutions**
- .1 Manufacturer of cladding, and installer shall demonstrate at least five years experience in projects similar in scope.
 - .2 This section establishes the standard of quality required for the cladding system. Proposed substitutions must meet this standard, and will be considered as follows:
 - a) A written request for approval of a substitution is received at least ten (10) days prior to tender closing.
 - b) The request includes a complete item-by-item description comparing the proposed substitution to the specified system, together with manufacturer's literature, samples, test data, engineering standards and performance evaluation indicating comparable standards to those specified.
- 1.8 Shop Drawings**
- .1 Submit shop drawings in accordance with Section 01340.
 - .2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, metal furring, and related work.
 - .3 Each shop drawing shall be stamped by a Professional Engineer.
 - .4 Submit samples of prefinished metal cladding for review by the consultant, prior to fabrication.
- 1.9 Handling and Protection**
- .1 Store cladding products in accordance with manufacturer's recommendations, and protected from elements.
 - .2 Protect prefinished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

PART 2 - PRODUCTS

2.1 Prefinished Metal Siding

Supply and installation of the following metal siding items:

.1 Vertical Metal Siding # (VMS-#):

Fabricate siding and related trims from zinc-coated steel, to ASTM-A446 Grade "A" with G90 zinc coating.

Panel Pattern:	Agway HF-11F
Panel Width:	12" [finished installed dimension] with intermediate fute and shadow-line recessed reveal between panels]
Profile Depth:	1.5" [38 mm]
Base Steel Thickness:	.033" / 0.762 mm
Metal Standards:	CGSB 93-GP-4M, CSA S136-01
Finish Coating Standards:	Class F1S (finished 1 side)

Pre-Finished Colours:

VMS-1: QC 2964, Silver Birch [Woodgrain Print Series]

VMS-2: AZM 150, Galvalume Plus [Plain Finish Series]

VMS-3 QC 28783, Bright White

All colours are to be in quantities and locations illustrated on architectural drawings. Steel coating to be rust-inhibitive, chemical-resistant coating Perspectra Plus or alternate by Arcelor Mittal.

Product to be supplied with all exterior-grade z-girts, accessories, finishing trims etc. as required for a complete product installation with concealed fasteners.

.2 Pre-Finished Metal Soffit (PMS):

Pre-finished metal soffit is to be installed at underside of canopies and overhangs throughout as shown on architectural drawings.

Fabricate soffit and related trims from zinc-coated steel, to ASTM-A446 Grade "A" with G90 zinc coating.

Panel Pattern:	Agway Status Hidden Fastener with V-Grooves
Panel Width:	12" with v-grooves at 6" o.c.
Profile Depth:	13/32" [10 mm]
Base Steel Thickness:	24 gauge
Finish/Colour:	QC 18-2411 Roasted Ash [woodgrain]
Metal Standards:	CGSB 93-GP-4M, CSA S136-01
Finish Coating Standards:	Class F1S (finished 1 side)

Product to be supplied with all exterior-grade furring strips,

anchoring accessories, finishing trims etc. as required for a complete product installation with concealed fasteners.

Ensure product is supplied in standard perforated [venting] strips, installed every 4th strip at 48" o.c. between non-perforated strips.

.3 **Trims & Accessories at Vertical Metal Siding and Prefinished Metal Soffit:**

Prefinished metal siding trims are to be used at all outside corners, inside corners, tops and bottoms of siding expanses (including required closures, edging strips, drips, sills, jambs, j-moulds etc.) between adjacent (differing) siding profiles and at decorative joints (at/between/adjacent to prefinished metal siding where shown on Architectural Building Elevations) and at all locations as required to ensure a fully finished product. All metal trims are to be provided by the metal siding manufacturer and are to be fully compatible with the siding profiles specified. All trims to be formed to provide positive water drainage to exterior of siding faces. Ensure the use of drip edge profile at underside of all horizontal trims.

General Trims:

'Self-edge' trims and flashing required for the installation of pre-finished metal siding materials are to match the colour of adjacent prefinished metal siding throughout [Galvalume Plus AZM 180] and are to be fabricated of 24 gauge stock.

- .4 Supply and install all supporting metal sub-girts, furring strips, spacers, flashings, trims and closures, fasteners etc. as required to complete the installation.
- .5 Sealants for exterior sheet (factory applied) flashings all to make the installation water tight.

2.2 **Supporting Sub-Girts, Spacers and Integral Thermal Clips**

- .1 Minimum 1.2mm (0.048 inches) thick formed galvanized steel, ASTM A446 Grade A with Z275 zinc coating.

2.3 **Fasteners**

- .1 **Concealed Fasteners at VMS-1 and at PMS:**
Concealed fasteners are to be set only into the concealed fastening flutes and/or fastener perforations and are to be small enough to permitting proper fit of adjacent interlocking pieces.

Acceptable product:

As recommended by the siding manufacturer for the intended application and siding type. Ensure use of self-sealing fasteners throughout, with J-1000 anti-corrosion plating/finish as supplied by Leland Industries Inc.

Leland Industries Inc., 95 Commander Blvd., Toronto, M1S 3S9

tel: 1-416-819-6399

NOTE:

Metal siding supplier to ensure that all fastener components and metal composition is compatible (i.e. creates no galvanic corrosion) with all materials being bonded.

- 2.4 Accessories/Trims
- .1 Flashing, Trim and Closures: Use only coil stock metal, pre-finished to match metal siding products (unless noted otherwise). Fabricate to profiles indicated on shop drawings and/or as required to meet performance requirements and to ensure positive drainage of rainwater away from cladding to the building exterior. Use preformed corner pieces only. Double- back (roll) exposed edges ensuring no sharp edges remain. Exposed trims including (without strict limitation to) inside corners, outside corners, cap strips, drip cap, undersill trim, starter strip trim are to be of the same material, colour and gloss-sheen as cladding (unless noted otherwise), with fastener holes pre-punched.
- Ensure the use of drip edges below all metal siding cladding situated above windows and door openings.*
- .2 Sealants:
 - .1 Concealed: Tape or compound, non-skinning, non-drying, butyl rubber.
 - .2 Exposed: One part silicone to CGSB 19-GP-18M. In accordance with Section 07900, Tremo 'Dymeric' Range.
- 2.5 Fabrication
- .1 Fabricate wall components to comply with dimensions, profiles, gauges and details as shown on the shop drawings, including fascia and soffit panels and all companion flashing.
 - .2 Fabricate all components of the system in the factory, ready for field installation.
 - .3 Provide cladding and all accessories in longest practicable length to minimize field lapping of joints.
- 3.1 Installation
- .1 Install all metal wall and roof cladding products in accordance with CGSB 93-GP-5M, and manufacturer's products written instructions respective to the intended application and all related design conditions.
 - .2 Install grits, thermal clips and subgirts as required to suit.
 - .3 Install continuous starter strips, inside and outside corners, edgings, drip, cap, sill and louvre opening flashings as indicated.

- .4 Install outside corners, fillers, and closure strips with carefully formed and profiled work.
- .5 Install fascia facings and exposed trim as indicated.
- .6 Maintain joints in exterior cladding as true to line, tight fitting, hairline joints.
- .7 Attach components in manner not restricting thermal movement.
- .8 Install all fasteners in quantities at centreline dimensions as recommended by the cladding manufacturer to suit the intended application.

NOTE: At all siding items with exposed fasteners, ensure that fasteners are installed plumb, true and aligned with each other. Following installation, all fasteners should look equally spaced and consistently aligned throughout. Ensure that all required sub-girts are installed to facilitate this final finished appearance.

- .9 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07900 - Sealants.

3.2 Final Touch-Up

- .1 Touch up minor paint abrasions with manufacturer approved touch-up paint.
- .2 Clean cladding by dry and/or wet wiping to ensure that it is free of dust and debris.

END OF SECTION 07465

PART 1 - GENERAL

- 1.1 General Division One, General requirements, is part of this section and shall apply as if repeated here.
- 1.2 Description of Work Provide all labour, materials and equipment required or called for in this specification, or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to any of the following:
- .1 The protection of the interior and exterior surfaces of the building to be worked on and any equipment on or under the roof surface(s) and/or adjacent to areas of metal siding.
 - .2 Fabrication, supply and installation of prefinished metal flashing at parapets, wall reglets, cant strips, flat roof edging, canopy edging, scuppers, junctures of metal siding with dissimilar cladding items etc.
 - .3 Sealing of all flashing reglets, end seams and mitres.
 - .4 Fabrication and supply of prefinished through-wall metal flashing to mason to be installed under section. Masonry Section 04220. Coordination shall take place between these two trades.
 - .5 Maintaining a clean work area and final clean-up of the site upon completion of the roofing.
- 1.3 Related Work
- .1 Built-up Roofing System Section 07510
 - .2 Prefinished Metal Siding Section 07465
 - .3 Building Sealants Section 07900
- 1.4 Approval
- .1 Submit samples of materials and profiles for Architect's and Consultant's approval before fabrication.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 **Pre-Finished Metal Flashing [PMF-#] Items:**
Fabricate flashings [denoted as PMF on drawings] from min. 24 gauge thick zinc-coated steel, to ASTM-A446 Grade "A" with G90 zinc coating. Break-shape stock throughout custom-shaped to required sizes and configurations as shown on Architectural drawings and/or as required on site. All products as supplied by Agway Metals.
Metal Standards: CGSB 93-GP-4M, CSA S136-01
Finish Coating Standards: Class F1S (finished 1 side)
Flashing colours to be in locations noted on drawings and as noted below:
PMF: QC 18-2964 Silver Birch

- .2 Fasteners: Screws will be weather guard hex head with 13mm (1/2") dome and neoprene washers. Nails - non-ferrous compatible with materials being installed.
- .3 Caulking: Polyurethane, conforming to CGSB 19-gp-24.
- .4 Underlay: Smooth, unsaturated quality resin sized paper weighing not less than 0.3kg/sq.m. (6 lbs/sq.).
- .5 Bitumen Paint: To conform to CGSB 1-Gp-108C.
- .6 Joint Filler: Extruded polyethylene, closed cell Shore A Hardness 20, tensile strength 20 to 30 psi (140 to 210 kilo pascals).
- .7 Prefinished through wall metal flashing: Supply to the masonry contractor 26 gauge flashing as per item .1 to the profile required for installation by the masonry contractor.

PART 3 - EXECUTION

3.0 Fabrication

- .1 All flashings to be in longest practical lengths throughout. Fabricate all possible work in shop in 2450mm (8'-0") lengths min. by brake-forming, bench cutting, drilling and shaping. Ensure shaping of all sheet metal to custom profiles shown on drawings.
- .2 Form bends with straight sharp lines and angles into true planes, free from twists, buckles, dents and other visual distortions. Double-back exposed metal edges at least 13mm (1/2"). Raw [cut and/or un-rolled] edges will not be permitted.
- .3 Supply all accessories required for installation of sheet metal work of this section. Fabricate accessories of same material as work with which they will be used.

3.1 Installation

- .1 Install sheet metal flashing at coping, wall expansion joints and curbs as shown on the drawings, or as otherwise required, for building components which penetrate roofs, and for which flashing are not specified in the work of other sections.
- .2 Sheet metal work shall be installed to properly cover the area to be protected and be watertight under all service and weather conditions. Install in a uniform manner, level, true to line, free of dents, warping and distortion.
- .3 Back-paint at the rate of 0.12 L/sq.m (0.25 gal/sq.) with bituminous paint, sheet metal that comes into contact with another kind of metal, masonry or concrete.
- .4 Install sheet metal with concealed fasteners at lock joints. Exposed fastenings will be permitted only with the approval of the Architect. Space all fasteners evenly in an approved manner. Use lead plugs and screw with rubber washers where metal flashing are installed over concrete or masonry.
- .5 Install underlay under sheet metal installed directly over concrete

or masonry surfaces. Overlap joints 100mm (4") and turn up 150mm (6") at edges where horizontal surfaces intersect vertical planes.

- .6 Join sheet metal by "S" lock seams, to permit thermal movement. Fill all joints with caulking as flashing is being installed. Clean off all excessive material visible subsequent to installation. Space joints evenly where exposed. Make corners by means of raised seams. Lock seam and caulk. Do not use pop rivets.
- .7 Slope all metal for positive drainage of water away from building and/or towards drains. Do not form open joints or pockets that fail to drain water.
- .8 Caulk all open sheet metal joints.
- .9 Wedge flashing into reglets joints with lead wedges at 300mm (12") o.c. at reglets wider than 9mm (3/8") and deeper than 19mm (3/4") provide polyethylene rod 25% wider than joint width. Prime and caulk all joints to ensure positive waterproof seal.
- .10 Ensure that raw metal edges do not come into contact with roofing membrane.

3.2 Finish

- .1 Prepare and touch up all scratches on pre-painted finish with matching paint (as recommended by pre-finished metal manufacturer) to the satisfaction of the Architect and Consultant.
- .2 Remove flux residue completely from surfaces and crevices. Remove fibre deposits or protection and wash metals left unpainted and exposed to view as specified by the metal manufacturer.

3.3 Field Quality Control

- .1 Include in work of this section supervision of roof flashing by roofing inspection company engaged for supervision of membrane roofing installation.
- .2 Inspection procedures specified shall govern for this Section also.

END OF SECTION 07620

PART 1 - GENERAL

- 1.1 General** Division One, General Requirements, is part of this section and shall apply as if repeated here.
- 1.2 Description of Work** Provide all labour, materials, and equipment required or called for in this specification, or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to any of the following:
- 1.3 Related Work** Shall include the following but not limited to:
- | | | |
|----|------------------------|---------------|
| .1 | Architectural Woodwork | Section 06400 |
| .2 | Steel Doors & Frames | Section 08100 |
| .3 | Painting | Section 09900 |
- 1.4 Environmental Conditions** .1 Sealant and substrate materials to be at temperature recommended by manufacturer for each type of sealant.
- 1.5 Samples** .1 Submit samples, in accordance with Section 01340, of each specified type of compound to be used together with the recommended primers and joint filler proposed to be used. Provide samples of available colours for selection by the Architect.
- 1.6 Warranty** .1 Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run, loose adhesion, or stain adjacent surfaces for three years.
- 1.7 Qualifications** .1 Only skilled and experienced tradesmen shall carry out the work in this section.
- .2 Report to the Architect any discrepancies or unclear items.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Primers: type recommended by sealant manufacturer.
- .2 Joint Fillers:
- | | |
|-----|---|
| (a) | General: compatible with primers and sealants, oversized 30% to 50%. |
| (b) | Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa. |
| (c) | Neoprene or butly rubber: round solid rod, Shore A hardness 70. |
| (d) | Polyvinyl chloride or neoprene: extruded tubing with 6mm minimum thick walls. |

- .3 Bond breaker: pressure sensitive plastic tape, which will not bond to sealants.
 - .4 Joint cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.
 - .5 Vent tubing: 3mm inside diameter extruded polyvinyl chloride tubing.
 - .6 Sealants:
 - (a) General Exterior Sealant: single component polyurethane base sealant to meet C.G.S.B. Specification 19GP5M and CAN 2-19-24-M90 such as Sikaflex 1A, Vulkem 116 by Tremco, or approved alternate.
 - (b) General Interior Sealant: single component sealant to meet C.G.S.B. specification 19GP17M and which can be painted, such as Tremflex 834 by Tremco, an approved alternate.
 - (c) Rubber asphalt sealing compound: one component, black rubberized asphalt: Bakor "570-05".
 - (d) High humidity sealant: one component, coloured, mildew resistant, silicone; Dow "786".
 - (e) Isolation paint: black asphaltic bitumastic paint; Bakor "410-02" or Domtar "Ace of Spades".
- 2.2 Preparation**
- .1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.
 - .2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
 - 3 Remove oil, grease and other coatings from non-ferrous metals with a compatible cleaner.
 - .4 Prepare concrete, masonry and glazed surfaces to sealant manufacturer's instructions.
 - .5 Examine joint sizes; minimum width of 6mm (1/4"); maximum width 25mm (1").
 - .6 Install joint filler to achieve correct joint depth to width ratio; minimum depth 1/2 width. Joint filler shall be oversized to remain under 25% compression within the joint, at minus 7 degrees C (20 degrees F.); set back in joint to achieve depth to width ratio as above.
 - .7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

- .8 Apply bond breaker tape where required to manufacturer's instructions.
 - .9 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
- 2.3 Application**
- .1 Apply sealants, primers, joint fillers and bond breakers to manufacturer's instructions and as required by job conditions.
 - .2 Coordinate with work of other sections to determine correct position of sealant application in sequence of work.
 - .3 Apply sealants using gun with proper size nozzle. Shape nozzle so as to finish sealant in a neat concave bead.
 - .4 Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
 - .5 Exposed sealant shall be smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities.
 - .6 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 of 1500 mm (5') oc vertically. Position tube to drain to exterior.
 - .7 Remove excess sealant and droppings using a recommended cleaner without damaging finished surfaces. Remove masking after tooling joints.
- 2.4 Schedule of Projections**
- Materials and application to be in accordance with manufacturer's recommendations and verified by their technical representative.
- .1 General exterior sealant: joints between exterior metal door frames and masonry; joints between window frames and siding control and expansion joints; sealing of joints between underside of concrete floor slabs and masonry; continuously at underside of metal sills; around all projections through exterior wall, hose bibs, pipes and the like; around all metal louvers; as per drawings and not necessarily covered herein; locations not filled with trim.
 - .2 General Interior Sealant: joints between door frames and masonry; masonry control and expansion joints; between built-in architectural woodwork and adjacent surfaces; control joints in gypsum board assemblies above suspended ceilings where pipes, ducts or other mechanical equipment passes through walls; at any other location indicated on drawings but not described herein; locations not covered by

- trim; at window sills and all toilet bases.
- .3 Rubber-Asphalt Sealant: around penetrations in foundation wall damp proofing; between roof sleeves and pipes, conduits, etc., penetrating roof; as bed for and between joints in concealed metal flashing; between sheet damp proofing and adjacent concrete and masonry surfaces; etc.
 - .4 High Humidity Sealant: joints between plumbing fixtures and surrounding material; joints between mirrors and metal fixtures; etc.
 - .5 Isolation paint: back priming of metal flashing; coating aluminum frame and structural components in contact with steel or masonry; priming of metal components built into roof assembly; etc.

END OF SECTION 07900

PART 1 - GENERAL

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| 1.1 | General | .1 | Division One, General requirements, is part of this Section and shall apply as if repeated here. | |
| 1.2 | Description of Work | | The work shall consist of the following but not limited to the supply and installation of the following: | |
| | | .1 | Fire-rated and non-rated interior hollow-metal steel doors, door frames and glazing screens (uninsulated) as indicated on the drawings. | |
| | | .2 | Prepare frames with continuous steel bar reinforcement at head of frames for door closures. | |
| | | .3 | Prepare frames with continuous bar reinforcement at jambs of frames for continuous piano hinges as shown on Door and Frame schedule. | |
| | | .4 | Prepare frame and doors to receive electrical wiring and control switches for barrier-free door operators supplied by other sections. | |
| | | .5 | Prepare frames and doors for intrusion alarms and all similar security items. | |
| | | .6 | Prepare frames and doors as required to receive electrical wiring for door strikes for card access system. | |
| | | .7 | All steel frames shall be metric-sized for metric concrete block coursing unless noted or required otherwise. | |
| | | .8 | Prepare frames and doors for all door hardware items supplied by other sections. | |
| | | .9 | The removal of existing steel doors, frames and/or glazing screens and all associated existing items thereon as required for the new scope of work outlined on the architectural drawings. | |
| 1.3 | Related Work | .1 | Structural Concrete Block Masonry | Section 04220 |
| | | .2 | Finish Carpentry | Section 06200 |
| | | .3 | Finish Hardware | Section 08710 |
| | | .4 | Sealants | Section 07900 |
| | | .5 | Glazing | Section 08800 |
| | | .6 | Painting | Section 09900 |

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| 1.4 | Requirements of Regulatory Agencies | .1 | Fabrication and installation of steel doors and frames is to be in accordance with Canadian Steel Door and Frame Manufacturers' Association, "Canadian Manufacturing Specifications for Steel Doors and Frames", (most current edition) except where specified otherwise. |
| | | .2 | Fabrication and installation of fire-rated steel doors and frames is to be in accordance with the requirements of NFPA-80. Rated doors and frames are to carry ULC Labels, permanently anchored; unlabelled units will be rejected. |
| 1.5 | Shop Drawings | .1 | Submit shop drawings in accordance with Section 01340. |
| | | .2 | Indicated each type of door and frame, fire rating, material, core type and thickness, mortices and reinforcements, location of anchors and exposed fasteners, arrangement of hardware, openings, glazing stops and finishes. |
| | | .3 | Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and in door schedule. |

PART 2 - PRODUCTS

All material notations provided below reflect minimum acceptable standards. For all fire-rated products, suppliers are to provide items fully achieving required/noted fire-resistance ratings. Modify and upgrade material gauges, material composition, fabrication techniques etc. as required to achieve specified ratings (noted on drawings and/or in Door Schedule) in accordance with hollow-metal manufacturer options and offerings.

All exterior doors, frames, hollow metal transoms and glazing screens are to be insulated throughout.

All interior doors, frames, hollow-metal transoms and glazing screens are to be un-insulated throughout.

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| 2.1 | Manufacturers | .1 | Fleming Door Products, Baron Steel Doors and Frames, Metal Door Ltd., Vision Hollow Metal Ltd. or approved alternate. |
| 2.2 | Materials-Steel Frames | .1 | Sheet steel: commercial grade steel W25 wiped zinc finish. <ul style="list-style-type: none"> (a) Frames: 1.5 mm (16 U.S. std. ga.) base thickness steel. (b) Floor anchors, channel spreaders and wall anchors: minimum 1.5 mm (16 ga.) base thickness steel. (c) Guard boxes: minimum 0.8 mm (22 ga.) base thickness steel. (d) Glazing stops: minimum 1.0 mm base thickness steel, screw fixed tamperproof (19 ga.) (e) Hardware reinforcing: 6 mm (1/4") steel plate. |

- .2 Reinforcing channel: 100 x 40 mm (C4 x 6.25).
 - .3 Door bumpers: black neoprene double stud
 - .4 Primer: to CGSB 1-GP.
 - .5 Anchors: Wire "T" masonry or welded in UL type.
- 2.3 Materials-Steel Doors
- .1 Interior Door Skins:
Sheet Steel: 1.2 mm (18 ga.) base thickness, commercial grade steel with wiped zinc finish, interior doors.
 - .2 Glazing and panel stops: minimum 1 mm (19 ga.) base thickness sheet steel with wiped zinc finish; tamperproof, screw fixed.
 - .3 Door Cores:
 - a) Interior Non-Insulated Doors: Honeycomb structural core consisting of kraft paper having 20 mm (3/4" max.) cell size to thickness indicated, pressure-laminated to face sheets
 - .4 Top and bottom channels: 1.5 mm (16 ga.) galv. steel channels.
 - .5 Reinforcing: hinges, 5 mm (6ga.): Lock and flush bolt 3 mm (10 ga.); surface hardware 1.5 mm (16 ga.)
 - .6 Primer: for touch up to CGSB 1-GP.
- 2.4 Fabrication-Frames
- .1 Form profiles accurately to approved shop drawings, free of kinks, twists and warps.
 - .2 Cut mitres and joints accurately and weld continuously on inside of frame profile. Where site welding or splicing is required due to size of unit, location of field joints shall be shown on Shop Drawings and strictly adhered to; avoid field welding where possible.
 - .3 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.
 - .4 Mortice, reinforce, drill and tap frames to receive templated strikes, butt hinges, and continuous piano hinges; check Hardware Schedule for requirements. Manufacturer to make allowance for morticed hardware.
 - .5 Weld guard boxes to frame at all strikes, hinges and concealed closers to completely enclose same.

- .6 Install stiffener plates or spreaders between frame trim where required to prevent bending of trim and to maintain alignment when setting and during adjacent construction work.
- .7 Provide 1.5 mm (1/16") clearance at head and jambs, and no more than 9mm (3/8") at floor. Provide clearance for intended finish flooring. Locate top hinges with top 125 mm (5") below door top, bottom hinges with bottom 250 mm (10") from floor, and intermediate hinges equi-distant between top and bottom hinges.
- .8 Provide adjustable "T" anchors or welded in UL type anchors for each jamb at approximately 600 mm (2'-0") centres. Provide floor anchors on frames that terminate at finished floor. Provide jamb extension anchorage on frames that terminate at slab.
- .9 Provide two welded-in channel or angle spreaders per door frame at bottom to ensure frame alignment.
- .10 Reinforce head of frames over 1200 mm (4') in width. Reinforce jambs of frames over 2400 mm (8') in height or where frame heads are unsupported by adjacent material; install reinforcing continuous from floor to structure above.
- .11 Install 3 bumpers on strike jamb for each single door and 2 bumpers at head for pairs of doors.
- .12 Construct thermally broken frames with continuous polyvinylchloride thermal breaks between inner and outer portions of frame.
- .13 Provide glazing stops in all areas requiring glass or panels, as indicated; stops to be on interior side of exterior frames.
- .14 All frames shall be bonderized and receive one coat of baked on rust inhibitive primer.
- .15 Install all glass with isolation and glazing tapes to suit, included any and all related fabrication techniques or accessories required to achieve specified fire-resistance ratings.

- 2.5 Fabrication-Doors
- .1 Doors shall be of hollow metal construction reinforced and stiffened with sound deadening kraft honeycomb, or rigid polyurethane insulation cores. Laminate core to both inside faces of the panels.
 - .2 Doors shall be flush with no face seams. Doors shall have vertical mechanically interlocking seams.

18 gauge interior doors shall be welded at 6" centres minimum and seam filled on both hinge and lock edges.
 - .3 Mortice, reinforce, drill and tap doors and reinforcements to receive hardware using templates provided by Finish Hardware supplier. Manufacturer to make allowance for morticed hardware.
 - .4 Make provision for glazing as indicated and provide necessary glazing stops. Stops on interior side of exterior doors.
 - .5 Doors shall be cleaned and sanded, given a coat of air drying past filler, again sanded to eliminate all unevenness or irregularities and given a baked on coat of rust-inhibitive primer.
 - .6 Install all glass in doors with isolation and glazing tapes to suit, included any and all related fabrication techniques or accessories required to achieve specified fire-resistance ratings.
- 2.6 Fire-Rated Doors, Door Frames, and Window Frames
- .1 Fabricate fire rated doors and frames in accordance with details and approved Shop Drawings; materials and fabrication shall conform to the requirements of NFPA-80.
 - .2 Glazing stops, anchor types and fastening shall conform to NFPA-80. Install all glass with isolation and glazing tapes to suit, included any and all related fabrication techniques or accessories required to achieve specified fire-resistance ratings.
 - .3 Attach ULC Labels to doors and frames with permanent fasteners.

PART 3 - EXECUTION

- 3.1 Frames
- .1 Set frames plumb, square, level and at correct elevation.
 - .2 Secure frames and screens to floor construction with two fasteners at each jamb, and set and brace them securely to maintain true alignment until built-in.
 - .3 Install temporary horizontal wood spreaders at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built in.
 - .4 Make allowance for deflection to ensure structural loads are not transmitted to frames.
 - .5 Install labeled fire rated frames with anchorage as required by NFPA-80.
- 3.2 Doors
- .1 Install hollow metal doors complete with hinges as supplied under the work of Section 08710.
 - .2 Install doors only when work has progressed to a stage when no damage will occur to them in place.
- 3.3 Adjusting and Cleaning
- .1 Hang doors to swing easily and freely on their hinges, to remain stationary in any position and to close tightly and evenly on frames without binding.
 - .2 Refinish damaged and defective work before completion of project. Refinishing of exposed surfaces shall show no discernible variation in appearance.

END OF SECTION 08100

PART 1 - GENERAL

- 1.1 General .1 Division One, General requirements, is part of this Section and shall apply as if repeated herein.
- 1.2 Description of Work The work shall consist of the following but not limited to:
- .1 The supply and installation of all thermal aluminum curtain wall systems, aluminum-framed thermally-broken windows and doors, sidelites and glazing screens etc. all with related components and accessories (as specified/as applicable) for a complete system including (without strict limitation to): aluminum framing components (including both fixed and operable sash), glazed vision panes, spandrel units, insulated back-pans behind spandrel panels, window screens, aluminum doors with related hardware as indicated, weather stripping, caulking within and around the curtain wall system, aluminum sills, all required anchorage components, fasteners, attachments, concealed interior (structural) reinforcing, shims, perimeter weather seals and all other items called for and/or as required as part of this scope of work.
 - .2 The supply and installation of all interior aluminum-framed glazing screens and interior aluminum doors c/w manufacturer-supplied hinges as specified herein.
 - .3 The supply and installation of all aluminum clad column covers (noted as ACC) at both the building interior and exterior as shown on the drawings.
 - .4 The investigation of all existing site and building conditions as they affect this scope of work, allowing for same herein, and ensuring that they factor into the pricing and related execution of this work.
 - .5 The on-site surveying of all dimensions related to architectural and other building features within and around curtain wall openings they impact the dimensions and of new curtain wall assemblies. All such detailed dimensions are to be reflected in the shop drawings at the time of their submission to the Architect.
 - .6 The supply and installation of tarping, boarding and any other temporary means required to ensure the water-resistance of the building envelope for all areas under construction affected by and/or related to the scope of work covered herein.
 - .7 Supply and installation of prefinished positively sloped, colour coordinating break-shape aluminum window sills below curtain wall and window items throughout (unless noted otherwise on architectural drawings).

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|-----|-----------------------------|----|---|---------------|
| 1.3 | Related Work | .1 | Final Cleaning | Section 01710 |
| | | .2 | Rough Carpentry | Section 06101 |
| | | .3 | Masonry | Section 04220 |
| | | .4 | Masonry Veneer Items | Section 04221 |
| | | .5 | Thermal & Moisture Membranes | Section 07261 |
| | | .6 | Prefinished Metal Siding | Section 07460 |
| | | .7 | Prefinished Metal Roofing/Siding | Section 07613 |
| | | .8 | Prefinished Metal Flashing | Section 07620 |
| | | .5 | Sealants | Section 07900 |
| | | .6 | Glass & Glazing | Section 08800 |
| | | .7 | Mechanical | Division 23 |
| 1.4 | Sub-Trade Quality Assurance | .1 | <p>Minimum Qualification for Successful Trade: The work of section shall be supplied, fabricated and installed by a company which has a minimum of 5 years of experience in the successful completion of projects of a similar size, design and quality, with a workforce of skilled personnel to complete the work in an efficient, professional and first-quality manner. The size of the Sub-Trades workforce will be critical for the timely execution of project requirements.</p> <p><i>General Contractors are responsible to ensure at the time of Tender that their Sub-Trade executing this component of the work complies with these minimum requirements. Following project award, the Contractor may be required to provide written proof of this qualification, relative to the Sub-Trade being carried, as well as a written outline of the workforce (installation crew) being committed to this project.</i></p> | |
| 1.5 | Reference Standards | .1 | <p>Aluminum Association (AA):</p> <p>a) DAF 45 [2003], Designation System For Aluminum Finishes.</p> | |
| | | .2 | <p>American Architectural Manufacturers Association (AAMA):</p> <p>a) AAMA-501-[2005], Methods of Test for Exterior Walls.</p> <p>b) AAMA-2603-[2002], Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.</p> <p>c) AAMA-2604-[2005], Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.</p> <p>d) AAMA-2605-[2005], Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.</p> <p>e) AAMA CW DG-1-[96], Aluminum Curtain Wall Design Guide Manual.</p> <p>f) AAMA CW-10-[2004], Care and Handling of Architectural Aluminum From Shop to Site.</p> | |

- g) AAMA CW-11-[1985], Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.
 - h) AAMA-TIR A1-[2004], Sound Control for Fenestration Products.
- .3 ASTM International (ASTM):
- a) ASTM A653 / A653M - [09a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - b) ASTM B209-[07], Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - c) ASTM B221-[08], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - d) ASTM C612 - [09], Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
 - e) ASTM E283-[04], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - f) ASTM E331-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - g) ASTM E413 - [04], Classification for Rating Sound Insulation.
 - h) ASTM E1105 - [00(2008)], Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
 - i) ASTM D2240 - [05], Standard Test Method for Rubber Property—Durometer Hardness.
- .5 Canadian General Standards Board (CGSB):
- a) CAN/CGSB-12.8-[97], Insulating Glass Units.
 - b) CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.
 - c) CAN/CGSB-19.13-[M87], Sealing Compound, One-Component, Elastomeric, Chemical Curing.
- .6 CSA International (CSA):
- a) CAN/CSA-S157-[2005], Strength Design in Aluminum.
 - b) CAN/CSA-S136-[2007], North American Specification for the Design of Cold-Formed Steel Structural Members.
 - c) CAN/CSA W59.2-[M1991(R2003)], Welded Aluminum Construction.
- .7 Environmental Choice Program (ECP):
- CCD-45-[1995], Sealants and Caulking Compounds.

- .8 Underwriter's Laboratories of Canada (ULC):
AN/ULC-S710.1 [2005], Standard for Thermal Insulation -
Bead-Applied One Component Polyurethane Air Sealant
Foam, Part 1: Materials Standard for Thermal Insulation -
Bead - Applied One Component Polyurethane Air Sealant
Foam, Part 1: Materials.
- 1.6 Samples & Submittals .1 **Manufacturer's Certification:**
Submit a letter from the manufacturer (on curtain wall
manufacturer's letterhead) certifying that the subcontractor
who has issued a purchase order, letter of intent or otherwise
has entered into contract with the manufacturer to supply and
install the related product. The letter must be dated and
include the:
- Name and Contact Info of the Manufacturer
 - Name of the project
 - Name of the approved sub-contractor
 - Complete list of product materials, components and
accessories to be incorporated into the work including
names, types and series numbers of all items being
installed
 - Manufacturer's Representative serving as contact for
this project with telephone, fax and email
numbers/addresses.
- Submit this certification prior to the preparation of
shop drawings.*
- .2 Submit to the Architect (upon his request) one representative
sample mock-up of typical aluminum window and/or curtain
wall assembly, complete with mullion types, vision glass,
spandrel panel, insulated back-pan, weep-drainage system,
attachments, anchors, caulking system and any other items
comprising the full system specified herein.
- .3 Submit to the Architect duplicate samples (12" x 12" size) of
all prefinished aluminum colours to be utilized on the project.
No related items are to be ordered without written sample
approval from the Architect.
- .4 Submit to the Architect duplicate samples (12" x 12" size) of
all hermetic vision pane types, all spandrel panel types and all
specialty ventilator units to be utilized on the project. No
related items are to be ordered without written sample
approval from the Architect.
- 1.7 Shop Drawings .1 Submit shop drawings of all windows and curtain-wall items,
clearly indicating opening sizes, materials and details for
head, jamb and sill, profiles of components and elevations of
units, structural or reinforcing members, anchoring details,
description of related components and exposed finishes and
fasteners, all in accordance with Section 01340.

- .2 Submit with shop drawings a letter from the identified manufacturer certifying that the details shown on the shop drawings accurately depict the identified manufacturers products. The letter must be dated and include the:
- Name of the project
 - Name of the sub-contractor
 - Manufacturers contact with telephone and telefax numbers
- Submit this certification with shop drawings.*
- .3 Submit one representative sample model and one corner cross section of each type of window, showing sill and jamb section, complete with hardware, weather stripping, glass, screening, etc., and other items to be used at the windows, including finishes.
- .4 Shop drawings for all curtain wall items are to be stamped (sealed) and signed by a **Registered Professional Engineer of Ontario**, ensuring that detailed design of the unit is approved for the intended application.
- 1.8 Test Reports**
- .1 Submit test reports from independent testing agency indicating that windows exceed the performance requirements of CAN/CSA-A440 or equal at the appropriate performance levels to meet climatic requirements, and as specified herein, resistance, thermal performance, ease of operation, load tests on screen, blocked operation.
- Submit a letter or certificate from aluminum profile extruder that the aluminum alloy is 6063 and has been heat treated to T6 temper.
- .2 Submit test reports showing compliance of curtain wall system with specified performance characteristics and physical properties including air-infiltration, water infiltration and structural performance.
- .3 Submit test reports verifying that insulated glazing vision panes used in curtain wall system comply with specified thermal standards.
- 1.9 Administrative Requirements**
- .1 Coordination with Trades: Coordinate work of this Section with work of other trades and for proper timing and sequence to avoid construction delays.
- .2 Project/Site Meetings: Comply with other Sections herein relative to periodic attendance at site meetings as required. Ensure availability of manufacturer's Technical Representative to provide technical input as required.
- .3 Manufacturer's Field Reports: Curtain Wall manufacturer to provide Site Reports in accordance with Section 3.4 Field Quality Control later herein. Copies of Field Reports are to be

submitted directly to the Architect within 3 days of representative's visit and site inspection.

- 1.10 Maintenance .1 Provide maintenance data for cleaning and maintenance of aluminum finishes and curtain wall systems for incorporation into maintenance manual specified in Section 01730.
- 1.11 Delivery, Storage & Handling .1 Delivery and Acceptance Requirements:
- deliver material in accordance with Section 01600
- deliver aluminum framing and glazing materials and related components in manufacturer's original packaging with identification labels in tact and on products sized to suit project requirements
- .2 Material Handling and Storage: to AAMA CW-10.
- .3 Storage and Handling Requirements:
Store materials off of ground and protected from exposure to harmful weather conditions, and keep within temperature ranges recommended by manufacturer.
- .4 Waste Management Requirements:
a) Separate and recycle or dispose of packaging material waste by an approved method as outlined related Sections elsewhere herein.
b) Separate and recycle or dispose of waste construction items by an approved method as outlined in related Sections elsewhere herein.
- 1.12 Warranty .1 Provide written joint warranty between the General Contractor and window manufacturer stating that finished/assembled curtain wall, window, glazing screens and aluminum doors and frames are guaranteed against defects and malfunction under normal usage for a period of 10 years from date of Substantial Performance, including insulated glazing units. Warranty to be provided by Manufacturer(s) in writing, and executed by an authorized company official. This written warranty is in addition to and not intended to limit other rights which the Owner may have under any other Contract conditions or provisions.

PART 2 - PRODUCTS

- 2.1 Materials .1 Acceptable Manufacturers:
Product shall be as manufactured by Alumicor, OldCastle Building Envelope or Kawneer. Alternate products will not be accepted.
- .2 Design Criteria:
a) Products to be designed to AAMA CW-DG-1
- design glazed aluminum curtain wall according to rainscreen principles
- ensure horizontal members are sealed to vertical

- members to form individual compartments in accordance with rainscreen principles
- ventilate and pressure-equalize air space outside exterior surface of insulation to the exterior
- b) Design Aluminum components to CAN/CSA S157.
- c) Design and size curtain wall components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of wall using design pressure of 0.95 kPa (20psi) to AAMA CW11/ASTM E330.
- d) Design curtain wall and window systems for thermal expansion and contraction caused by cycling temperature range of 95 degrees C (surface temperature of system components) over a 12-hour period without causing detrimental effect to interior or exterior system components.

Ensure systems are able to withstand a temperature differential of 85 degrees C (ambient environmental temperature) without any adverse effect on system components and no deterioration of seals.

- e) Design vertical expansion joints with baffled overlaps and compressed resilient air seal laid between mullion ends.
- f) Ensure system is designed to accommodate:
 - movement within curtain wall assembly
 - movement between system and perimeter framing components
 - dynamic loading and release of loads
 - deflection of structural support framing
 - shortening of building concrete structural columns
 - creep of masonry, steel and concrete building components
 - mid-span slab deflections
 - action of door hardware and related items attached to aluminum framing members
- g) Limit mullion deflection to prevent breakage of glass and to ensure maximum recovery of all materials.
- h) Deadload prevention: design curtain wall system with separate, integrated support for insulating glass units.
- i) Size all glass units to CAN/CGSB-12.20
- j) Flatness criteria: 6mm max. in 6 m run for each panel
- k) Air Infiltration: 0.63 cfm maximum of wall area to AAMA 501, ASTM E283 at differential pressure across assembly of 0.044 psi.
- l) Water Infiltration: None to AAMA 501, ASTM E331, ASTM E1105 at differential pressure assembly of 0.104 psi.
- m) Interior surfaces shall have no condensation before exposed edges of sealed units reach dew point temperatures during testing to AAMA 501.
- n) Maintain continuous air-barrier and vapour-retarder

throughout building envelope and curtain wall assembly.

- o) Ensure no vibration harmonics, wind whistles, noises caused by thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or system components occur.

.3 **ALUMINUM-FRAMED WINDOWS (W-#):**

All **fixed sash** in aluminum framed windows tagged as W/# to be:

Model 1200-5-AR Series, fixed window units having a (5") deep frame with thermal break to CAN/CSA-A440, performance levels Air Leakage - Fixed, Water Leakage B7, Wind Load C5, Condensation Resistance - Frame I-60, Glass I-59, complete with a B7 sill manufactured by Old Castle Building Envelope *or* Alumicor Model 1970.

All **awning style operable sash** [where shown on Architectural Drawings and Window Schedule] in aluminum framed windows to be:

Old Castle Building Envelope '2000-AR Series Arctic Open-Out Casement Vents, Top-Hung'

or

Alumicor UltraVent 1350 Series Top-Hung (Open Out Casement) units (with +/- 3" perimeter sightlines) throughout.

Casement units to be supplied complete with 1 THPO roto-operator, 2 claw locks and 2 friction arms per vent, all in standard clear aluminum mill finish. All venting units to be equipped with black fiberglass screens

.4 **Insect Screens:**

Flyscreens between the sashes (at operable sash components in aluminum-framed windows) shall meet CGSB 79-GP-1M and CAN#-A440-M90 rating heavy duty, accommodated in extruded aluminum frame having a wall thickness of 1.9mm, finish as specified. Screen cloth shall be:

18 x 14 fiberglass mesh (black)

Fly-screens shall be located between the interior and exterior sliders and shall be removable.

.5 **Aluminum Cap Flashing [ACF]:**

Aluminum clad column covers noted as ACF on Architectural Drawings to be:

break shape aluminum in 0.051" [1.0mm] thickness (gauge), pre-finished in clear anodized aluminum throughout.

.6 **FINISHES at ALUMINUM WINDOWSS:**

- a) **Finish at Exterior Aluminum Windows :**

- all faces of *fixed framing components* at aluminum framed windows, curtain wall and door frames to be finished in:
clear anodized aluminum
 - b) **Finish of Operable Sash Components in Aluminum Framed Windows[W-#] and Curtain Wall [CW-#]:**
 - all faces of *sliding operable sash components* within aluminum framed curtain wall and windows to be finished in:
PPG Duranar XL (3-Coat System) in colour 074 Graphite Grey UC115095XL
 - c) **Finish at Aluminum Cap Flashing [ACF]:**
 - interior and exterior ACC items to be finished in:
PPG Duranar XL (3-Coat System) in colour 074 Graphite Grey UC115095XL
- .7 Isolation coating: alkali resistant bituminous paint in accordance with Section 07900.
- .8 Sealants: in accordance with Section 07900 in colour(s) selected by architect.
- 2.2 **Window Performance Requirements (Air Infiltration)**
- .1 Air Leakage; Operable Windows:
Maximum 0-55 M/3/H metre of sash crack length when tested to ASTM E283-73. Rating A-3, CAN/CSA-A440.

Fixed Windows:
Maximum 0-25 M/3 /H/ M/2 when tested to ASTM E283-73. Rating Fixed, CAN/CSA-A440.
- .2 Water Resistance:
No evidence of water on interior face of frame when tested to ASTM E547 and CAN/CSA-A440 to level B5 at test pressure 500 Pa.
- .3 Wind Load Resistance:
To CAN/CSA-A440, when tested to ASTM E330. Rating - C5 - at test pressure 5000 Pa.
- .4 Condensation Resistance:
Window shall be tested to CAN#-A440-M90 for condensation resistance to determine "I" Value to meet winter design temperature and selected relative humidity.

Horizontal Window - Glass - I-61, Frame - I-55
Fixed Window - Glass - I-59, Frame - I-63
- 2.3 **Fabrication**
- .1 Construct frames to profiles and face sizes shown on drawings.
- .2 Design frames in exterior walls to accommodate expansion and contraction within service temperature range of -34 degrees C to 75 degrees C. Make allowances for

defection of structure, ensure that structural loads are not transmitted to aluminum work.

- .3 General - Fabricate windows using two separate frames joined by means of a thermal break as follows:

Cope and butt join all joints in main frame and sash neatly in weather tight manner and secure by means of screws anchored into integral screw ports. Secure sash corners with thread cutting type screw to ensure tight corners when re-assembling after glass repairs have been made. Internally seal all sash corners. De-burr and make smooth all sharp milled edges and corners of sash and screen frames. Provide outside main frame sill with device extending beyond plane of operating tracks which will prevent the removal or accidental loss of exterior sash or screens to exterior. Provide sill members with minimum 5 degrees slope. Provide sill weep system which will facilitate drainage of water accumulating in sill area, while preventing passage of air, dirt and insects to interior. Fabricate and anchor both inner and outer frames using specified screw fasteners without violating the thermo-barrier. Exposed fasteners or the use of pop rivets not acceptable.

- .4 Fabricate entire window in a manner that will allow easy replacement of any defective, damaged or worn components, hardware or weather stripping.

- .5 Fixed Windows:

The fixed unit shall consist of two separate frames, joined by means of a thermal break. All joints of the frame shall be butt-type, joined neatly in a weather tight manner. The units shall be designed for field glazing, using a combination semi-solid/wet seal at the exterior weathering joint and a concealed screw applied stop with a resilient gasket at the interior. The stop shall be extruded aluminum.

- .6 Aluminum Horizontal Sliding Window Operation (Style A):

Exterior sash: left operates, right fixed

Interior sash: left operates, right operates

Completely separate all operating sash surfaces from metal to metal contact. Provide sash members with continuous, integral type pull handles. Provide quiet, smooth sash operation using nylon glides concealed in sash bottom rails or stainless steel roller wheels. Provide dual weather stripping in sash bottom rails, below nylon glides, which will clean the sill rib as the sash is operated. Provide all interior and exterior operating vents with spring loaded metal locking device to provide automatic locking in closed position at jams. All operating sash shall be easily removed from the interior for cleaning.

- .7 Thermo Barrier:

Provide complete metal-to-metal separation between the two main frame members. Do not use connecting screws, clips or other devices which would tend to bridge the two frame members or restrict in any manner the expansion and contraction of the individual separate frame members. Factory seal between Thermo-Barrier and frame around the entire perimeter to ensure weather tight assembly.

- .8 Glazing:
Provide sash frames which will permit glass replacement without the use of special tools.
- .9 Weather stripping:
Double weather strip window units at all sash perimeters. Conceal weather stripping to prevent accumulation of foreign matter due to cleaning, operation or handling which would reduce effectiveness or life of seal.
- .10 Install all weather stripping in specially extruded ports and secure to prevent shrinkage, movement or loss when removing sash for cleaning or glass replacement.
- .11 Exterior Panning Trim:
Provide one piece sections designed to lock into window frame. Join planting sections at corners, utilizing integral screw ports and screws and back seal. Sheet metal formed shapes not acceptable.
- .12 Screens:
Factory install in tubular extruded aluminum frames and secure in place using vinyl spline. Screen is to be located between the interior and exterior sash. Screen guide channels or fins which facilitate the operation of the screen shall be an integral part of the window frame or thermal barrier. Channels or fins which are surface applied to the window frame or thermal barrier by means of screws or rivets are not acceptable. Screens must meet CAN3-A440-M90 screen rating - heavy duty.
- .13 Apply isolation coating to aluminum to be in contact with dissimilar metals or cementitious materials.
- .14 Manufacturer's nameplates on frames and screens are not permitted.

PART 3 - EXECUTION

3.1 INSTALLERS

- .1 Use only curtain wall manufacturer's authorized installers meeting work experience requirements outlined earlier in this Section.

3.2 EXAMINATION

- .1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for curtain wall installation in accordance with manufacturer's written instructions.
 - a) Visually inspect substrate in presence of Consultant.
 - b) Inform Consultant of unacceptable conditions immediately upon discovery.
 - c) Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.3 INSTALLATION

- .1 Install curtain wall in accordance with manufacturer's written instructions.
- .2 Do aluminum welding to CAN/CSA W59.2.
- .3 Attach curtain wall assemblies to structure plumb and level, free from warp, and allow for sufficient adjustment to accommodate construction tolerances and other irregularities.
 - a) Maintain dimensional tolerances and align with adjacent work.
 - b) Use alignment attachments and shims to permanently fasten elements to building structure.
 - c) Clean welded surfaces and apply protective primer to field welds and adjacent surfaces.
- .4 Install thermal isolation where components penetrate or disrupt building insulation.
- .5 Install sill flashings (where applicable).
- .6 Co-ordinate installation of fire stop insulation, in accordance with Section [07840 - Firestopping], at each floor slab edge [and intersection with vertical construction where indicated].
- .7 Install smoke sealing in accordance with Section [07800 - Fire and Smoke Protection] where indicated.
- .8 Co-ordinate attachment and seal of perimeter air barrier in accordance with Section [07270 - Air Barriers].
- .9 Co-ordinate attachment and seal of perimeter vapour retarder in accordance with Section [07260 - Vapour Retarders].
- .10 Install [fibrous insulation] [liquid foam insulation] in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

- .11 Install insulating glass units and infill panels in accordance with Section [08800- Glazing] and to manufacturer's written instructions.
- .12 Install perimeter sealant [to method required to achieve performance criteria, backing materials, and installation criteria in accordance with Section [07920 - Joint Sealing].

3.04 FIELD QUALITY CONTROL

- .1 Field Inspection: Coordinate field inspection in accordance with Section [01 45 00 - Quality Control].
- .2 Site Installation Tolerances:
 - a) Variation from plumb: [12 mm per 30 m (0.5 inches per 100 feet)] maximum.
 - b) Misalignment of two adjacent panels or members: [0.8 mm (0.03 inches)] maximum.
 - c) Sealant space between curtain wall and adjacent construction: [13 mm (0.5 inches)] maximum.
- .3 Manufacturer's Services:
 - a) Coordinate manufacturer's services with Section [01 45 00 - Quality Control].
 - b) Submit to Consultant a written agreement from the manufacturer to perform the manufacturer's services.
 - c) Schedule manufacturer's review of work (including site inspections and written reports) at the following stages:
 - 1 review at commencement of work
 - 1 review at 50% completion of work
 - 1 review at full completion of work
- .4 Submit manufacturer's Written Reports to Consultant describing:
 - a) The scope of inspection/reporting services provided.
 - b) Date, time and location of site review.
 - c) Observed installation procedures performed by Sub-Trade noting extent of work complete and conformance to manufacturer's recommendations.
 - d) Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions relative to the intended application.
- .5 Limitations or disclaimers regarding the procedures performed.
- .6 Obtain reports within seven days of review and submit immediately to Consultant.

3.05 CLEANING

- .1 Progress Cleaning: Perform cleanup as work progresses [in accordance with Sections addressing Cleaning and Waste Management]. Leave work area clean end of each day.
- .2 Final leaning: Perform final cleaning of new curtain wall systems and glazing components (vision pane and spandrel panels, caps, aluminum composite panels etc.) to remove all signs of construction and related debris. Panels to be left cleaned and clear of blemishes, spots, smears etc.
- .3 Waste Management:
 - a) Co-ordinate recycling of waste materials with Sections elsewhere addressing Construction Waste Management and Disposal.
 - b) Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.
 - c) Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.06 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by glazed aluminum curtain wall installation.

PART 4 - ON-SITE TESTING

4.1 On-Site Testing

- .1 The Owner reserves the right to appoint an independent testing agency to test installed windows at random for compliance with all requirements contained in the specification. Failure to meet these requirements shall make the contractor liable for full replacement and/or rectification costs for items of concern (cited in Testing Report) as well as cost of further (third party) tests to verify compliance of system including rectification items.

END OF SECTION 08150

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the insulated, translucent sandwich panel system and accessories as shown and specified. Work includes providing and installing:
 - 1. Flat insulated, translucent sandwich panels
 - 2. Aluminum clampite installation system
 - 3. Aluminum flashing attached to Skyroofs

- B. Related Sections:
 - 1. Structural Engineering Drawings [S-#]
 - 2. 0550- Miscellaneous Metal Fabrication
 - 3. 07420- Aluminum Composite Panels
 - 4. 07460- Prefinished Metal Siding & Soffit
 - 5. 07620- Prefinished Metal Flashing & Sheet Metal

1.2 SUBMITTALS

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles, and finishes of components.

- B. Submit shop drawings. Include plans, elevations, and details.

- C. Submit manufacturer's color charts showing the full range of colors available for factory finished exposed aluminum.
 - 1. Submit samples for each material used in the project, in same thickness and finish indicated for the work, in the minimum sample size indicated below.
 - a. Translucent Sandwich Panels: 7" x 12" sample size
 - b. Factory finished aluminum: 3" long sample sections

- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.

- E. Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed reports will be acceptable if for current manufacturer and indicative of products used on this project.
1. Reports required (if applicable) are:
 - a. Flame Spread and Smoke Developed (UL 723) – Submit UL Card
 - b. Burn Extent (ASTM D 635)
 - c. Color Difference (ASTM D 2244)
 - d. Impact Strength (UL 972)
 - e. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)
 - f. Bond Shear Strength (ASTM D 1002)
 - g. Beam Bending Strength (ASTM E 72)
 - h. Insulation U-Factor (NFRC 100)
 - i. NFRC System U-Factor Certification (NFRC 700)
 - j. NFRC Visible Light Transmittance (NFRC 202)
 - k. Solar Heat Gain Coefficient (NFRC or Calculations)
 - l. Condensation Resistance Factor (AAMA 1503) (Thermally Broken, insulated panels only)
 - m. Air Leakage (ASTM E 283)
 - n. Structural Performance (ASTM E 330)
 - o. Water Penetration (ASTM E 331)
 - p. Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure (ASTM E2707)
 - q. Fall Through Resistance (ASTM E 661)
 - r. Class A Roof Covering Burning Brand (UL 790)
 - s. UL Listed Class A Roof System (UL 790) (Optional) – Submit UL Card

1.3 CLOSEOUT SUBMITTALS

- A. Provide field maintenance manual to include in project maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope, and location. At least three of the projects shall have been in successful use for ten years or longer.
 2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural, and water infiltration testing of sandwich panel systems by an accredited agency.
 3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components, and production sandwich panels for conformance with AC177 "Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems" as issued by the ICC-ES.

- B. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing Kalwall panel systems for at least two consecutive years and can show evidence of satisfactory completion of projects of similar size, scope, and type.

1.5 PERFORMANCE REQUIREMENTS

- A. The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.
1. When requested, include span analysis data.
 2. Standard panel system shall have less than 0.01 cfm/ft² air leakage by ASTM E 283 at 6.24 PSF (50 mph) and no water penetration by ASTM E 331 at 15 PSF; and structural testing by ASTM E 330.
 3. Structural Loads. Provide Skyroof system capable of handling the following loads:
 - a. Snow Load (PSF): 48 PSF
 - b. Wind Load (PSF): 46 PSF
- B. Deflection Limits:
1. Skyroof: Limited to L/60 of clear span for each assembly component.
- C. Thermal Movements: Allow for thermal movements from ambient- and surface-temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 110 deg F (43 deg C), ambient; 150 deg F (66 deg C), material surfaces.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver panel system, components, and materials in manufacturer's standard protective packaging.
- B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.7 WARRANTY

- A. Provide manufacturer's and installer's written warranties agreeing to repair or replace panel system work, which fails in material or workmanship, within one year from the date of delivery. Failure of material or workmanship shall include deterioration of finish on metal in excess of normal weathering; and defects in accessories; insulated, translucent sandwich panels; and other components of the work.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The basis for this specification is for products manufactured by Kalwall Corporation. Other manufacturers may bid this project subject to compliance with the performance requirements of this specification and submission of evidence thereof. Listing other manufacturers' names in this specification does not constitute approval of their products or relieve them of compliance with all the performance requirements contained herein.
- B. Kalwall Corporation, Tel: (800) 258-9777 – Fax: (603) 627-7905 – Email: info@kalwall.com

2.2 PANEL COMPONENTS

A. Face Sheets:

1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
 - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
 - b. Face sheets shall not deform, deflect, or drip when subjected to fire or flame.
2. Interior face sheets:
 - a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater 50 and smoke developed no greater than 450 when tested in accordance with UL 723.
 - b. Burn extent by ASTM D 635 shall be no greater than 1".
3. Exterior face sheets:
 - a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5° facing south as measured on a white sample, with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
 - b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact minimum of 70 ft. lbs. without fracture or tear when impacted by a 3-1/4" diameter, 5 lb. free-falling ball per UL 972.
 - c. Erosion Protection: Integral, embedded-glass erosion barrier.
4. Appearance:
 - a. Exterior face sheet: Smooth, 0.070" thick and white in color.
 - b. Interior face sheet: Smooth, 0.045" thick and crystal in color.
 - c. Face sheets shall not vary more than ± 10% in thickness and be uniform in color.

B. Grid Core:

1. **Aluminum** I-beam grid core shall be of alloy and temper recommended by manufacturer with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16".

C. Laminate Adhesive:

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council "Acceptance Criteria for Sandwich Panel Adhesives".
2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to four separate conditions:
 - a. 50% Relative Humidity at 68° F: 540 PSI
 - b. 182° F: 100 PSI
 - c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
 - d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

2.3 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
1. Thickness: 2-3/4 inches
 2. Grid Core Insulation: Fill panel cores with air
 3. Panel U-factor by NFRC certified laboratory:
 - a. 2-3/4" aluminum grid
 4. Grid pattern as viewed: 12 x 24 shoji
- B. Standard panels shall deflect no more than 1.9" at 30 PSF in 10'-0" span without a supporting frame by ASTM E 72.
- C. Panels shall meet the conditions of acceptance according to ASTM E2707 Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure:
1. Absence of flame penetration through the wall assembly at any time.
 2. Absence of evidence of glowing combustion on the interior surface of the assembly at the end of the 60-min observation period.
 3. Absence of evidence of flame, glow, and smoke if the test is terminated prior to the completion of the 60-min observation period.
- D. Thermally broken, insulated panels: Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.
- E. Skyroof System:
1. Skyroof system shall pass Class A Roof Burning Brand Test by UL 790.
 2. **(Optional)** Skyroof system shall be UL listed as a Class A Roof by UL 790, which requires periodic unannounced factory inspections and retesting by Underwriters Laboratories.
- F. Skyroof System shall meet the fall through requirements of OSHA 1910.21 as demonstrated by testing in accordance with ASTM E 661, thereby not requiring supplemental screens or railings.

2.4 ALUMINUM CLAMPTITE INSTALLATION SYSTEM

- A. Aluminum clamp-tite installation system:
 - 1. Clamp-tite screw type closure system shall be of extruded aluminum alloy and temper as recommended by manufacturer.
 - 2. Skyroof perimeter aluminum clamp-tite installation system at curbs shall be factory sealed to panels.
- B. Sealing tape: Manufacturer's standard, pre-applied to aluminum clamp-tite installation system at the factory under controlled conditions.
- C. Fasteners: 300 series stainless steel screws for aluminum clamp-tite installation system, excluding final fasteners to the building.
- D. Finish:
 - 1. Clear Anodized Aluminum Mill Finish

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer shall examine substrates, supporting structure, and installation conditions.
- B. Do not proceed with panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection:
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by sealant manufacturer for this purpose.
 - 2. Where aluminum will contact concrete, masonry, or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by sealant manufacturer.

3.3 INSTALLATION

- A. Install the panel system in accordance with the manufacturer's fabrication drawings and suggested installation instructions.
 - 1. Anchor component parts securely in place by permanent mechanical attachment system.
 - 2. Accommodate thermal and mechanical movements.
 - 3. Seal aluminum clamp-tite installation system as shown on the manufacturer's fabrication drawings and suggested installation instructions.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's fabrication drawings and suggested installation instructions.

3.4 FIELD QUALITY CONTROL

- A. Water Test: Installer to test a representative section of installed materials according to procedures in AAMA 501.2.
- B. Repair or replace work that does not pass testing or that is damaged by testing and retest work.

3.5 CLEANING

- A. Clean the panel system, interior and exterior, immediately after installation.
- B. Refer to manufacturer's written recommendations.

END OF SECTION 08452

PART 1 - GENERAL

- | | | | |
|-----|-------------------------------------|----|--|
| 1.1 | Description of Work | .1 | All Finish Hardware [related to doors throughout] is to include [without strict limitation to] the following:
a) Hardware for all hinged man doors (butt hinges, adjustable piano hinges, closers, locks and latches, bolts, panic bars, kick plates, pulls etc.)
b) Mortised hardware (where specified)
c) Door stops in floor or wall types as required.
d) Metal thresholds, sweeps, weather-stripping. |
| 1.2 | Preparation | .1 | Supply of Finish Hardware is to be as per attached Appendix containing "Finish Hardware Schedule". |
| | | .2 | Installation of the above noted Finish Hardware to be done by a certified hardware installer. Installation by General Contractor will not be permitted. |
| 1.3 | Related Work | .1 | Finish Carpentry: Section 06200 |
| | | .2 | Steel Doors and Frames: Section 08100 |
| | | .3 | Architectural Woodwork: Section 06400 |
| 1.4 | Requirements of Regulatory Agencies | .1 | All Hardware on fire rated doors and frames to conform to requirements of NFPA-80 and to bear ULC label. |
| 1.5 | Qualification | .1 | Personnel who will be responsible for scheduling detailing, ordering, and coordination hardware for this project, shall be experienced hardware consultants. Regular membership in the American Society of Architectural Hardware Consultants is acceptable evidence of such experience. |
| 1.6 | Coordination | .1 | The finish hardware contract shall be the responsibility of hardware supplier to request shop drawings from related trades for coordinating. |
| | | .2 | Before supplying materials, ensure by check of drawings, shop drawings and details prepared for the Project, that listed hardware is suitable by dimension and function for intended purposes. |

- .3 Work of this Section shall include assistance and supervision of installation when requested, and as otherwise provided by the supplier, to ensure correct installation. After installation of all hardware and before building is accepted, the Contractor shall request the hardware supplier to inspect the installations and certify that the hardware is properly installed in accordance with the manufacturer's recommendations. The guarantee, as published by each manufacturer, will begin when the Owner accepts the building.
- 1.7 Submittals
 - .1 Hardware Supplier to prepare required submittals of product noted in Appendix "A" with cut-sheets of all items as per Section 01340.
- 1.8 Delivery and Storage
 - .1 Receive and check all hardware from supplier. Protect from pilferage at all times.
 - .2 Store finishing hardware in locked, clean and dry area.
 - .3 Package each item of hardware, including fastenings, separately or in like groups of hardware. Label each package as to item, definition and location.

PART 2 - PRODUCTS

- 2.1 Material
 - .1 Products shall be as noted in accompanying 'Hardware Schedule'.
 - .2 Supply with specified hardware screws, bolts, expansion shields, inserts, and other items and parts required for complete installation and function.
- 2.2 Manufacturers
 - .1 Refer to accompanying "Hardware Schedule".
- 2.3 Keying
 - .1 Refer to accompanying "Hardware Schedule".

PART 3 - EXECUTION

- All items to be installed in full accordance with manufacturers' recommendations for the intended application relative to the door types noted on the Architectural drawings.

END OF SECTION 08710

PART 1 - GENERAL

- | | | | |
|-----|--------------------------|----|--|
| 1.1 | General | .1 | Division One (01000 series specifications) General requirements, is part of this Section and shall apply as if repeated here. |
| 1.2 | Description of Work | | The work shall consist of the following but not limited to: |
| | | .1 | Hermetically sealed double pane (insulating) glazing units in locations shown on the drawings. Hermetically sealed double pane glass units may include vision panes and/or spandrel panes as indicated on the drawings. |
| 1.3 | Related Work | .1 | Final Cleaning Section 01710 |
| | | .2 | Demolition Section 02100 |
| | | .3 | Rough Carpentry Section 06101 |
| | | .4 | Finished Carpentry Section 06200 |
| | | .5 | Sealants Section 07900 |
| | | .6 | Hollow Metal Doors & Frames Section 08100 |
| | | .7 | Aluminum Windows Section 08150 |
| 1.4 | Dimensions | .1 | The Contractor shall carefully check all frames and openings to be glazed in the field to determine all opening sizes; do not cut the glass until dimensions have been site-verified. |
| 1.5 | Glass Breakage | .1 | The Contractor shall be responsible for all glass broken or unsuitable because of faulty setting or manufacturer's errors or product failure Glass broken by others shall be replaced by the glazing sub-contractor. |
| 1.6 | Environmental Conditions | .1 | Glaze with compounds, sealants or tapes only when glazing surfaces are at temperatures over 45°F (7.5°C), and when positive that no moisture is accumulating on them from frost, rain, mist, or condensation. |
| 1.7 | Glass Design | .1 | This contractor shall be responsible for proper glass thickness, design and type as required by all prevailing Codes and mandated legislations. Report any such discrepancies in glass design, type and thickness immediately to the Architect during tendering. |
| | | .2 | Glass types, sizes and locations to be as shown on Architectural drawings and all related door, frame, window and glazing Schedules as applicable. |

PART 2 - PRODUCTS

- 2.1 Glass Materials
- .1 Polished float glass to CAN2-12.3M and amendments; glazing "A" quality, thickness and tint as indicated. Units to be tempered, frosted, laminated where specified or where required by the O.B.C.
 - .2 Sealant compound: multicomponent, chemical curing to CAN2-19.24 M80 type 2, class A, black colour.
 - .3 Glazing tape for non-rated applications: pre-formed butyl tape, Tremco 440 black colour, 5mm thick x 10mm wide.
 - .4 Glazing tape for fire-rated glass: must be PVC, 3mm thick x 12 mm wide
 - .5 Setting blocks: neoprene, Shore "A" durometer hardness 80, 75mm long x 2.4mm thick x 5mm high.
 - .6 Spacer shims: neoprene, Shore "A" durometer hardness 70, 75mm long x 2.4mm thick x 5mm high.
 - .7 Primer-sealers and cleaners: to glass manufacture's standard.
 - .8 Low-E solar rejection film shall be as specified, applied to surfaces noted.
- 2.2 Fabrication
- .1 **GLASS at INTERIOR DOORS and GLAZING SCREENS:**
Standard Applications:
 Single pane glass at interior doors, sidelights and glazing screens (denoted on drawings as 'gl.' and/or 'glass') is to be clear 6mm min. thick glass throughout as noted:
 - clear tempered impact-resistant glass in all panes below 7'-2" a.f.f
 - clear float glass in all panes above 7'-2" a.f.f.
Fire-Rated Applications:
 Fire-rated glass in doors, sidelights, transoms, glazing screens and related applications (denoted on the Schedule and/or drawings as 'F.R.GL.' and/or ' fire-rated glass') is to be selected by the glazing trade (from the material options below or approved alternate materials) in the appropriate thickness and material type required to accommodate the glass sizes and fire-protection ratings shown on Drawings and/or as indicated on the Schedules. [NOTE: Re-design of the frames and/or reduction of glass unit sizes specified to attain required rating-rated and labelled throughout].

 All fire-rated glass is to be impact safety-rated throughout without the use of surface-applied films. Impact resistance is to be achieved either by use of tempered or laminated glass.

 Product options include:

- Vetrotech 'Keralite Select Laminated Safety Glass', fire-rated impact-safety ceramic glass, 8 mm thick as manufactured by Saint-Gobain; ensure glass is labeled to minimum fire-rating as indicated on drawings

or

- Pyran 'Platinum L' fire-rated impact-safety ceramic glass, 8 mm thick as manufactured by Schott AG; ensure glass is labeled to minimum fire-rating as indicated on drawings

or

- Vetrotech 'Contraflam' fire-rated impact-resistant glass (annealed glass laminated to intumescent inter-layers) as manufactured by Saint-Gobain; ensure glass is labeled to minimum fire-rating as indicated on drawings

Fire-rated glass material selection is to be determined by the Glazing Trade from the noted options [or from approved alternates] and is to be suited to the required fire-protection rating level (and to and the glazing sizes) shown on the Drawings and related Schedules. Select glass type to ensure that the finished door assembly (with related door, sidelights, and transoms) and/or the assembled glazing screen (as applicable) can be certified (labeled) to the specified fire-protection rating according to recognized Canadian Testing authorities/agencies having jurisdiction.

Note that acceptable glass options include materials that provide both fire-protection and impact safety without the use of surface-applied films. Non-impact resistant fire-rated glass products will not be accepted.

Ensure that all installed panes of impact-protection fire-rated glass are duly labeled (with a permanent etching) to provide Manufacturer's Name, Product Name, UL or ULC mark, indication of fire-resistance rating/duration in minutes and/or any alternate information required by Code.

2.2 Fabrication

.1 VISION PANE (VP) INSULATED GLAZING @ EXTERIOR WINDOWS & DOORS:

Vision panes of insulating/hermetic glazing is to be used in:

- all fixed sash
- all awning window operable sash

components of exterior windows and/or doors.

Insulated Glazing/Hermetic glass units are to be supplied by Oldcastle Building Envelope, Trulite, Saand or approved alternate.

Insulated Glazing units are to be 25.4 mm thick Double-Glazed Hermetically Sealed Unit consisting of:

- *Exterior Sheet:*
6 mm Vitro Glass/PPG 'Solargray' tinted glass,
tempered, with PPG Solarban 60 film on surface 2
or
6 mm Guardian 'Gray Float' tinted glass, tempered,
with Sunguard 'SN 68' film on surface 2
- *Vacuum Space:*
1/2" argon-gas space (90% argon, 10% air) with
'Technoform I-Spacer' in colour black
- *Interior Sheet:*
6 mm clear glass, tempered

.2 FIRE-RATED VISION PANE (FR-VP) INSULATED GLAZING @ EXTERIOR WINDOWS & DOORS:

Vision panes of fire-rated insulating/hermetic glazing is to be used in:

- fixed sash hollow metal fire-rated frames only where noted on drawings

Insulated Glazing/Hermetic glass units are to be supplied by Oldcastle Building Envelope, Trulite, Saand or approved alternate.

Insulated Glazing units are to be 25.4 mm thick Double-Glazed Hermetically Sealed Unit consisting of:

- *Exterior Sheet:*
6 mm Vitro Glass/PPG 'Solargray' tinted glass,
tempered, with PPG Solarban 60 film on surface 2
or
6 mm Guardian 'Gray Float' tinted glass, tempered,
with Sunguard 'SN 68' film on surface 2
- *Vacuum Space:*
argon-gas space (90% argon, 10% air) [airspace widthg to suit] with 'Technoform I-Spacer' in colour black or alternate warm-edge spacer sized to suit
- *Interior Sheet:*
1-hour fire-rated glass [F.R.GL.] as noted in section 2.2.1 herein

PART 3 - EXECUTION

- 3.1 Examination**
- .1 All wood and steel shall be properly primed by others before glazing, and primer must be hard and dry. All openings must be free from moisture, frost, rust, dirt, plaster, cement, oil or grease.
 - .2 The Glazing sub-contractor shall examine all openings to be glazed and shall report any conditions which may affect the work of this trade before commencing. Commencement of work will be construed as an acceptance of conditions.
- 3.2 Installation of Interior Glazing**
- .1 Remove protective coatings and clean contact surfaces with Interior solvent and wipe dry. Apply primer-sealer to contact surfaces.
 - .2 Glazing compound shall be neatly run in straight line paralleled with glazing rebate. Corners shall be carefully made.
 - .3 All glass shall be back and face bedded in glazing compound with 3mm (1/8") clearance on all sides. Glass shall be set on setting blocks as required, with equal bearing on the entire width of plane. Convex side of glass shall be on exterior.
 - .4 Insert spacer shims to centre glass in space. Place shims at 100mm o.c. Keep 6mm below sight line.
 - .5 Install removable stops, without displacing tape or sealant.
 - .6 Apply cap bead of sealant, at exterior void, in a uniform and Level line, flush with sight line, tooled or wiped with solvent to smooth appearance.
- 3.3 Thermal Glazing Installation**
- .1 Accurately measure glass openings and calculate glass size based on manufacturer's installation tables allowing for proper edge engagement, rabbet width, rabbet depth, tolerances for expansion and contraction etc.
 - .2 Before glazing, verify openings to see that they are square, plumb, and in true planes. If found otherwise, do not proceed with glazing until proper corrections are made.
 - .3 Set hermetically sealed insulated glass units on setting blocks placed at ¼ points from each corner of glass.
 - .4 Dry glaze by means of EPDM gaskets on interior and preformed glazing tape with built-in shim on exterior.

3.4 Cleaning

- .1 Immediately remove all excess sealant and compound and droppings from finished surfaces.
- .2 Clean all glass prior to handover to Owner, ensuring it is clear of surface soiling and debris of any sort.

END OF SECTION 08800

PART 1 - GENERAL

- | | | | |
|-----|---------------------------------|---|--|
| 1.1 | Description of Work | The general scope of work shall include, but not be limited to the following: | |
| | | .1 | All gypsum wall board, cement board, steel studwork, steel furring and framing etc. throughout the building interior and exterior. |
| | | .2 | Supply and installation of all sound and fire insulation materials at interior building assemblies. |
| 1.2 | Related Work | .1 | Steel Doors and Frames Section 08100 |
| | | .2 | Mechanical Section 15000 |
| | | .3 | Finish Carpentry Section 06200 |
| | | .4 | Acoustical Ceilings Section 09130 |
| | | .5 | Painting & Decorating Section 09900 |
| | | .6 | Structural Steel Stud Section 09110 |
| 1.3 | Product Handling | .1 | Store product in protected dry areas. Store gypsum board lying flat in piles with edges protected. |
| | | .2 | Ensure that metal members are not bent, dented, or otherwise deformed. |
| | | .3 | Deliver products supplied under the work of this Section only to those who are responsible for installation, to the place they direct, and to meet installation schedules. |
| 1.4 | Environmental Conditions | .1 | Install work only in areas closed and protected against weather, and maintained between 10 degrees C and 21 degrees C. In cold weather ensure that heat is introduced in sufficient time, before work commences, to bring surrounding materials up to these temperatures; and maintained until materials installed by this Section have cured. |
| 1.4 | Environmental Conditions | .2 | Provide adequate ventilation to carry off excess moisture during curing of joint compound and textured finishes. |

PART 2 - PRODUCTS

- 2.1 Materials
- .1 All materials to be supplied by Canadian Gypsum Company, Domtar or approved alternates.
- .2 Steel stud framing: to ASTM C645 formed from minimum 0.5mm (25 ga.) thickness hot-dipped galvanized steel sheet, meeting ASTM A525 and A568, for screw attachment of gypsum board. Knockout service holes at 450mm minimum o.c. Stud size to be as noted on the drawings.
- Steel gauge of studs to be as noted above only as a minimum and shall be increased in gauge as required to suit job requirements. Select stud gauge to related wall heights utilizing one single stud for height of wall. Select stud gauge for bulkheads respective to length of bulkhead and any anchoring loads to be accommodated by the studs from glazing screens, doors and similar items.
- .3 Furring Channel: ASTM C645, 1.5mm (16 ga.) 32 x 22 mm (1 1/4" x 7/8") galvanized metal.
- .4 Corner bead: galvanized metal 32 mm (1 1/4") flange.
- .5 Edge trim: "J" or "L" profile galvanized metal, minimum 22 mm (7/8") flange.
- .6 Runner channels: meeting ASTM A525 and A568; 1.2 mm (18 ga.), 38 mm x 19 mm (1 1/2" x 3/4") galvanized metal.
- .7 Hanger wire: galvanized 4 mm (8 ga.).
- .8 Tie Wire: galvanized 1.2 mm (18 ga.)
Fasteners Type S Bugle head or as otherwise required, in lengths to suit application.
- .9 **General-Use Gypsum Wall Board (GWB) on Walls & Ceilings:**
Gypsum board on Interior Wall Surfaces above 8'-0" (2440 mm) above finished floor:
Product to be 15.9 mm (5/8") thick standard paper-faced gypsum board Type 'X' fire rated; 1200 mm (4') width sheets in lengths to suit tapered edges and square cut meeting CSA A82-27-M.
- Gypsum Board on Interior Ceilings, Bulkheads, Underside of Stairs and general overhead applicaitons:** use 5/8" thick gwb generally throughout with Type 'X' fire-resistance rating
- Note: various ceilings on drawings may require 2 layers of 5/8" type X GWB to provide a 1-hour fire-resistance rating in accordance with SB-2 of the O.B.C.

- .10 **Abuse-Resistant Gypsum Wall Board (GWB):**
GWB on Interior Wall Surfaces below 8'-0" (2440 mm) above finished floor:
Product to be 5/8" thick Georgia-Pacific 'Dens Armor Plus Abuse Resistant Interior Panels' with moisture-resistant core faced in coated fibre-glass matts. Product inherently meets type 'X' fire-rating requirements. Board widths to be 4'-0" x longest practical lengths to suit.
- .11 **Moisture-Resistant GWB for Ceilings:**
Moisture-resistant gypsum wall board to be used on ceilings in the following rooms:
- 156B Shower
 - 156C Change Area & B.F. Washroom
 - 158B Shower
 - 158C Change Area & B.F. Washroom
- Acceptable product to be 5/8" thick CGC 'Sheetrock Brand Mold Tough Fire Code' board with moisture and mould-resistant cores & facing paper all c/w integral fire-resistance rating.
- .12 Joint tape: perforated paper; 50 mm (2") width.
- .13 Joint filler compound: to ASTM C474.67, ready-to-use; all purposed, for base coats, special topping grade for final coat.
- .14 Vapour Barrier 0.25 mm (6 mil) polyethylene sheet.
- .15 VOC content of all adhesives and sealants used shall be as per limits specified in Section 01359.

PART 3 - EXECUTION

3.1 Examination

- .1 The installing sub-contractor shall examine all ceilings and wall surfaces to which his work is attached; report to the Contractor, in writing, any defects of work prepared by other trades and unsatisfactory site conditions.
- .2 Before work of this Section commences ensure that services have been installed, tested, and approved by relevant jurisdictional authorities, that conduit, pipes, cables, and outlet are plugged, capped, or covered; and that fastenings and supports installed by others are in place. Do not permit work of others to touch the back of wallboard.

- 3.2 Installation .1 Framing and furring shown on Drawings is indicative but do not regard it as exact or complete. Construct work to provide adequate strength to withstand stresses imposed by use and application conditions without distortion. Maintain dimensions indicated on Drawings and execute work in accordance with regulations governing fire rated assemblies and separations.
- Ensure that all gwb panels/panel types are installed and finished in full accordance with panel manufacturer's recommendations, notwithstanding notations to the contrary herein. Use all manufacturer recommended fasteners, joint tapes, joint compounds, application products and installation techniques suited to the intended application.*
- .2 Erect supporting and finish materials to dimensions indicated on Drawings; plumb, level, straight, and square to adjoining elements. Install work within 3 mm (1/8") of dimensioned location unless otherwise approved, flat to a tolerance of 1:1000 (1/8" in 10.0") overall and 1.5 mm (1/16") maximum in any 300 mm (1.0").
- .3 Do not support the work of this Section from, nor make attachment to: ducts, pipes, conduit, or the support framing of the work of other sections.
- .4 Do not apply gypsum board in close proximity to hot pipes or heating ducts.
- .5 Install materials with the minimum of joints. Tightly butt joints, without force, and neatly align them.
- .6 Provide clearances required at mechanical and electrical services, such as grilles, diffusers, access panel, and lighting fixtures only after verification of requirements in each case.
- .7 Provide freedom for deflection under beams and structural slabs.
- .8 Do not use or install metal framing, trim, or accessories which have bent or otherwise deformed.
- 3.3 Installation: Steel studs and Wall Furring .1 Install steel stud and wall furring as specified and/or as otherwise required for fire rated separations or protection.
- .2 Align partition tracks plumb and level at ceiling or bulkheads as shown on the drawings, secure at 600 mm o.c. (2'-0") maximum.
- .3 Place studs in tracks vertically at 400 mm (16") o.c. and not more than 50 mm (2") from abutting walls, and at each side of openings. Cross brace steel studs or add horizontal stiffeners as required to provide rigid installation to manufacturer's instructions.

- .4 Attach studs to bottom and ceiling track using screws. No crimping allowed.
 - .5 Coordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
 - .6 Coordinated erection of studs with installation of doors and special supports or anchorage for work specified in other Sections.
 - .7 Erect studs for fascia in similar manner.
 - .8 Install wall furring for gypsum board wall finished at 400 mm (16") o.c.; install furring for other material as indicated nest channels 200 mm (8") at splices.
 - .9 Furr duct shafts, beams, columns, pipes and exposed serviced where indicated. Provide access doors at clean outs and fire dampers.
- 3.4 Installation:
Gypsum Bd.
Ceiling Framing
- .1 Erect hangers, runner and furring channels for suspended gypsum board ceiling as specified or as otherwise required to provide fire rated ceilings separation or protection.
 - .2 Anchor hangers to structure.
 - .3 Space hangers for runner channels to suite structure, to support ceiling load, at a maximum distance of 1,200 mm o.c., and at no greater distance than 150 mm (6") from ends of runner channel. Bend rod hangers securely in place with saddle ties.
 - .4 Install runner channels at 1200 mm (4'-0") o.c., generally, and at no greater distance than 150 mm (6") from terminations of supported cross furring members or adjacent walls. Provide 25 mm (1") clearance between runners and abutting walls and partitions.
 - .5 Splice runner channels by lapping at least 300 mm (12") with interlocking flanges and wired at each end with two loops. Splice only where unavoidable. Do not bunch or line up spliced.
 - .6 Install cross furring at 600 mm (24") o.c., no closer than 25 mm (1") and at no greater distance than 150 mm (6"), from walls, openings, breaks in continuity of ceiling, and changes of direction. Space furring in all cases to suite incorporated services, and so as to avoid contact with perimeter walls, span furring channels no greater than 1200 mm (4'-0"); use metal studs for greater spans as approved by Architect.
 - .7 Secure cross furring to supports with double loops of tie wire or approved equivalent attachment. Splice by nesting and tying together within 200 mm (8") overlap.

- .8 Frame perimeter of openings for access panels, light fixtures, diffusers, grilles, etc. with furring channels to maintain integrity of framing.
 - .9 Furr for gypsum board faced vertical bulkheads within or at termination of ceilings.
 - .10 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
 - .11 Erect entire hanger and suspension system to adequately support the ceiling assembly, including services incorporated, with a maximum deflection of 1/360 in the span of each component member, and free from horizontal movement. Install work level to tolerance of 1:1200 (1/8" in 12'-6").
- 3.5 Installation:
Gypsum Board Panels
- .1 Install gypsum board wall and ceiling finishes in gypsum panel type and thicknesses indicated and/or as otherwise required to provide required fire-rated separations, ratings or protection.
 - .2 Apply wallboard with long dimension perpendicular to supports. Back all joints with framing member.
 - .3 Install wallboard in maximum lengths and widths to minimize joints, and never in lengths of under 1800 mm (6'-0"). Stagger end joints where they are unavoidable. Locate joints in soffits where least prominently discerned.
 - .4 Form neat joints at mill ends and at field cut edges of wallboard panels. Cut paper on face with a knife. Smooth by sanding and rubbing edges together.
 - .5 Fasten wallboard to metal support members by sheet metal screws no closer than 9 mm (3/8") to, and no farther than 12.5 mm (1/2") from, centre of joints, and at 300 mm (12") maximum o.c. at edges and on intermediate supports. Where two layers of wallboard are used, screw outer layer through inner to metal framing.
 - .6 Finish all exposed edges of wall board panels, or where gypsum board butts against a surface having no trim concealing its juncture, with appropriate metal trim, Erect plumb or level with minimum joints. Where trim abuts block or brick walls, the joint shall be carefully caulked to overcome irregularities in the masonry wall.
 - .7 At external corners install corner beads secure through wallboard, to framing at 150 mm (6") o.c. on alternate flanges.
 - .8 Ensure that all gwb reveals are installed level and true throughout and are compounded in place, flush with surrounding gwb faces. Ensure that joints between adjacent reveals are seamed imperceptibly.

- 3.6 Taping and and Filling
- .1 Fill joints between boards, at edge trim and corner beads, all screw holes and depressions on wallboard surfaces exposed to view to provide smooth seamless surfaces and square neat corners. Use jointing compounds and reinforcing tapes in conformance with manufacturer's specifications. Ensure that wall board is tight against framing members, fasteners are properly depressed, and adhesives have sufficiently cured.
 - .2 Fill at joints by three-coat method:
 - (a) Embed reinforcing tape in a cover of joint filler.
 - (b) Apply level coat of joint filler when cover coat has dried.
 - (c) Apply skim coat of topping cement when level coat has dried.
 - .3 At beveled joints: apply cover coat 178 mm (7") wide, level coat 254 mm (10") wide, and skim coat 300 mm (12") wide.
 - .4 At end joints, and butt joints formed at cut edges of wallboard: apply cover coat 356 mm (14") wide level coat 508 mm (20") wide, and skim coat 600 mm (24") wide. Camber treatment over end joints to 0080 mm (1/32") thick.
 - .5 At Internal Corners: first fill gaps between boards with joint filler. Imbed creased reinforcing tape in a thin coat of joint filler applied 52 mm (2") wide at each side of corner. Apply cover coat as specified for beveled joints. Apply skim coat (as specified for beveled joints) to just one side of joint, and when dry apply skim coat to other side.
 - .6 At External Corners: fill to nose of corner bead with joint filler and topping cement as specified for beveled joints.
 - .7 At edge trim: as specified for beveled joints.
 - .8 At screws and heads: fill holes and depressions with a two coat application of joint filler so as to be invisible after painting is complete.
 - .9 At control joints: as specified for beveled joints both sides. Do not fill control joint.
 - .10 Feather edges of compounds into surfaces of wallboards. After skim coat has dried for at least 24 hours sand lightly to leave smooth for decoration. Do not sand paper face of wallboard.
 - .11 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

- .12 Cement Board Finishing: wherever cement board is used as a ceiling finish, supply and install fiberglass mesh and cementitious plaster skim coat(s) as required to provide a smooth consistent surface, suitable for painting and resistant to moisture and vapour from showers, cooking equipment and/or any other fixtures, equipment items etc.

- 3.7 Patching and Cleaning
 - .1 Remove droppings and excess joint compound from work before it sets.
 - .2 Vacuum clean working areas at the end of each day to reduce traffic of gypsum dust through other areas.
 - .3 Make good to cut-outs for services and other work. Fill in defective joints, holes and other depression with joint compound; ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.
 - .4 Clean off beads, casings and other metal trim, and leave all surfaces ready for specified finishes.

- 3.8 Protection
 - .1 Provide adequate protection of materials and work of this section from damage by weather and other causes. Protect other work from damage resulting from work of this section.
 - .2 Any damage caused to work of this section shall be repaired by this section at this sections expense to the satisfaction of the Architect.

END OF SECTION 09111

PART 1 - GENERAL

- | | | | |
|-----|--|--|--|
| 1.1 | General | Division One, General Requirements, is part of this section and shall apply as if repeated here. | |
| 1.2 | Description of Work | Provide all labour, materials, and equipment required or called for in this specification, or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to the supply and installation of: | |
| | | .1 | New lay-in acoustical ceiling panels and metal suspension grid systems for SAT ceiling assemblies as indicated on the Drawings and Schedules. |
| | | .2 | Removal and modification of existing suspended acoustic ceiling panels and suspension systems as required by the work outlined in the drawings. This may also include the re-installation of existing salvaged tiles (possibly involving cutting) as well as the modification and alteration of existing suspension grids as required throughout. |
| 1.3 | Related | .1 | Metal Stud and Gypsum Board Section 09111 |
| | | .2 | Painting and Decorating Section 09990 |
| | | .3 | Mechanical Fixtures Section 15000 |
| | | .4 | Electrical Fixtures Section 16000 |
| 1.4 | Requirements of Regulatory Agencies | .1 | Install ceilings that serve as fire protective membranes exactly as specified in Underwriter's Laboratories text design specifications. Verify, before installation of ceiling, that work specified in other Sections, as a part of the entire assembly, is installed to meet validating specification for a ceiling-floor or a ceiling roof assembly. |
| | | .2 | Materials supplied shall carry marks identifying them as U.L.C. approved for the particular use and assembly. |
| 1.5 | Submittals | .1 | Samples: Submit samples of each specified acoustical board, suspension components, and exposed grid material. |
| | | .2 | Affidavits: Submit to Architect two (2) copies of affidavits in accordance with Section 01300 to verify that ceiling meets fire protective requirements. |
| | | .3 | Extra Stock: Provide two sealed cartons of each specified acoustical ceilings for Owner's use. Deliver to Owner as directed. |

- 1.6 Product Handling
 - .1 Deliver all products in fully sealed packages.
 - .2 Store all materials in a protected dry area.
 - .3 Ensure that pre-finished metal members are not bent, dented, or otherwise deformed or blemished.
 - .4 Deliver products supplied under the work of this Section to those who are responsible for installation, to the place they direct, and to meet installation schedule.

- 1.7 Environmental Conditions
 - .1 Install work only in areas closed and protected against weather, and maintained at no less than 10 degrees C. (50 degrees F.)
 - .2 Do not install work in any area unless satisfied that work in place has dried out, and that no further installation of damp materials is contemplated.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Materials shall be supplied with all means of fastening as recommended by the manufacturer for the particular type of installation, and to include all clips, etc., to make the tile and grid system conform to the requirements of the U.L.C. tested assembly where a fire rated ceiling is required.

 - .2 Acoustical tile panels and suspension systems in locations as illustrated on Reflected Ceiling Plans and Architectural Drawings are to be as noted below.
SAT (Standard Lay-In Tile):
 Tiles: 24" X 48" X 3/4" Armstrong "School Zone Fine Fissured" #1714 square lay-in tiles in white factory finish *with*
 Grid: Armstrong "Prelude ML 15/16" exposed tee system" in white factory finish

or

 Tiles: 24" X 48" X 5/8" Rockfon "Rockfon Education Standard" square lay-in tiles in white factory finish *with*
 Grid: Rockfon "Chicago Metallic 200 Snap Grid" 15/16" in #01 white factory finish

 - .3 Accessories: Miscellaneous clips, splicers, connectors, screws, and other standard accessories shall be steel, zinc coated or cadmium plated, strength and design compatible with suspension methods and system specified.

 - .4 Hangers: Galvanized annealed steel wire: 2.5mm diameter (#12 ga.) to support a maximum weight of 68 kg/hanger (150 lbs.)

 - .5 Inserts and Hanger Connections: Steel; galvanized after forming; suitable for structure and ceiling conditions, and loading; and approved by Architect before work commences.

PART 3 - EXECUTION

- 3.1 Cooperation .1 The contractor shall cooperate with all other trades concerned to ensure a satisfactory installation. This contractor shall furnish the electrical trade all necessary information so that their lights and fixtures will conform to the centres and joining of the tiles and panels.
- 3.2 Scaffolding .1 The contractor shall provide all necessary scaffolding required for the proper execution of the wall and ceiling finishes. Scaffolding shall be erected to interfere as little as possible with the work of the other trades and shall be removed immediately on completion of the work of this section.
- 3.3 Examination .1 Ensure that environmental conditions and work preceding this Section are satisfactory and will permit compliance with the quality and dimension required of this work.
- .2 Verify that work performed under other Sections as a part of an Underwriter Specification for a fire rated protective assembly has been done in accordance with that Specification.
- 3.4 Installation .1 Install grid system ceilings as specified by the manufacturer of the system. Ensure that methods of installation used are acceptable to the manufacturer of each system component and in conformance with requirements of U.L.C. rated assemblies where required.
- .2 Coordinate work of this Section with that of other Sections. Ensure that adequate preparation is made for attachment of hangers and fasteners. Do not use through the-roof hangers. Provide for carrying and integration of flush-mounted and recessed services components only after consultation and verification of methods and locations with those performing the work of Sections 15000 and 16000.
- .3 Space hangers for supporting grid generally at 1200mm (48") nominal centres each way, to suit structure and ceiling system. Secure wire hangers to framing by bending sharply upward and wrapping securely with three turns. Install hangers free of kinks, provide extra hangers for each corner of lighting fixtures, and reinforce other ceiling equipment with hangers. Secure hangers to structure by a permanent method as approved by Architect.
- .4 Install the entire hanger and suspension grid to adequately support the ceiling assembly, including services incorporated, with a maximum deflection of 1/360 of the span of each component member, and free from horizontal movement. Provide intermediate support channels as and when required between structural building components securely wired thereto. Install hangers at no more than 5 degrees off vertical.

- .5 Frame and trim all openings as required for recessed lighting fixtures, diffusers, grilles and openings.
 - .6 Lay out work in accordance with Drawings to provide even spacing in each area, with grid lines symmetrical about room axes, columns and service dimensions on opposite sides of areas. Work shall include suitable moldings as required where ceilings abut walls or other vertical surfaces.
 - ✕7 Maintain true surface planes, and component and joint lines throughout each area.
 - .8 Butt joints between components tightly together.
 - .9 Only install new tiles free from any visible irregularities on the surface face, edges or corners. When utilizing salvaged existing tiles (only in locations permitted on Architectural drawings) select the cleanest and most blemish-free tile from reclaim stock for re-use.
 - .10 Brace system to maintain alignment of grid.
 - .11 Adapt installation to provide for access to ceiling where required for services.
 - .12 Mark access panels in an unobtrusive manner.
 - .13 Work shall include expansion joints in ceiling where required or indicated.
- 3.5 Tolerances
- .1 Install ceilings within a variation of +/- 5 mm (3/16") of dimensioned height above floor unless approved otherwise by Architect, and level within a maximum tolerance of 1 mm in 1000 mm (1/8" in 10'-0").
- 3.6 Cleaning
- .1 Clean soiled or discoloured surfaces of exposed work on completion of work.
 - .2 Replace components which are visibly damaged, marred, or uncleanable.
 - .3 Final cleaning is specified in Section 01700.
- 3.7 Repair
- .1 Repair any fire protection removed or damaged by work in this Section in accordance with Section 07812.

END OF SECTION 09130

PART 1 - GENERAL

1.1	Work Included	.1	Floating Portland Cement Terrazzo infill in all locations noted in the Contract Documents.	
		.2	Localized patch and repair of existing terrazzo flooring and coved terrazzo base where/as required by construction and related demolition, matching new terrazzo to surrounding existing terrazzo (to remain).	
1.2	Related Work	.1	Cast-in-Place Concrete	Section 03300
		.2	Masonry	Section 04220
		.3	Porcelain Tile	Section 09315
		.4	Resilient Tile Flooring	Section 09660
1.3	Requirements Regulatory Agencies	.1	All terrazzo must be installed in full accordance with the methods prescribed by the Terrazzo Tile and Marble Association of Canada, as outlined in their latest Specification and Installation Guides/manual.	
1.4	Quality Assurance	.1	Terrazzo Contractor must have a minimum of 5 years of experience in installations of equal or greater size than the scope of work required for this project. Experience must include installations of the terrazzo type specified for this project.	
1.5	References	.1	C.S.A.: Canadian Standards Association	
		.2	C.G.S.B.: Canadian General Standards Board	
		.3	N.S.C.: National Standards of Canada	
		.4	ANSI: American National Standards Institute	
		.5	T.T.M.A.C.: Terrazzo, Tile and Marble Association of Canada	

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| 1.6 | Samples | .1 | Submit two 300mm x 300mm (12" x 12" "control samples" of each terrazzo colour (once approved by the Architect), in accordance with Section 01340 prior to beginning work on-site. The Architect reserves the right to request up to 3 different samples per terrazzo colour, varying chips and matrix as requested prior to determining the approved "control sample" for each colour. Sample colours and properties as selected by the Architect. Approved "control samples" will be held by the Architect and the terrazzo applicators on site, and all work on site must conform to the control samples without exception. |
| | | .2 | Submit manufacturer's maintenance instructions in accordance with Section 01340. |
| 1.7 | Environmental | .1 | Maintain minimum heat 12 degrees C (54 degrees F) and not more than 21 degrees C (70 degrees F) for a period of seven days before, during and following installation. |
| 1.8 | Qualifications | .1 | Application shall be by franchised approved applicators of the TTMAC only. |
| 1.9 | Delivery, Storage and Handling | .1 | Deliver, store and handle products in a manner to avoid damage. Minimum temperature 15 degrees C (60 degrees F) to storage. |
| 1.10 | Site Conditions | .1 | Examine the areas which the work of this section is to be located. |
| | | .2 | Do not begin installation of any terrazzo until all improper site conditions have been rectified in accordance with the requirements of the Terrazzo Tile and Marble Association of Canada. |
| | | .3 | Protect work during installation and protect finished corners exposed to construction operations and traffic. |
| 1.11 | Maintenance | .1 | Provide data for maintenance of terrazzo flooring in accordance with Section 01730. |

PART 2 - PRODUCTS

2.1 MATERIALS

TERRAZZO (TZ):

Product to be Floating Terrazzo in depths and thicknesses as noted in PART 3 herein and as noted in TTMAC manual.

Terrazzo Repair:

Localized terrazzo repair is required at various areas of demolition and related new construction. Approximate extent and locations is indicated on Architectural drawings, though actual extent may vary.

Colour of localized terrazzo patch and repair (chip colours, chip sizes, matrix colour) is to match abutting existing terrazzo colour(s) throughout as closely as possible.

Floating Terrazzo Materials:

- .1 Cement: Portland cement to CAN 3-A5-M77 Type 10
- .2 Sand: Sharp, screened sand: CAN 3-A23.1-M77. Sand colours to be as required to support Architect's specified grout/matrix colour.
- .3 Water: Clean drinkable water, free from oil, acids, alkali or organic matter.
- .4 Marble Chips: marble chips, a blend of sizes up to but not exceeding T.T.M.A.C. standard No. 3 chips size. Mix shall be defined by chip sizes and chip colours, specified in percentages as determined by the Architect. The Architect reserves the right to select any combination and colour of chips available from the full T.T.M.A.C. colour range, including both domestic and foreign chips.
- .5 Colour pigments: non-fading mineral pigments to British standard 1014. Number, degree and quantity of pigments to be as required to match Architect's supplied colour sample.
- .6 Reinforcing mesh: 50mm x 50mm No. 16 x No. 16, steel mesh, electrical welded, galvanized after fabrication, conforming to CSA Standard G30.5.

- .7 **Divider Strips:** 32mm deep x 1/8" wide white alloy zinc with integral anchorage.
 Minimum number of divider strips as noted below plus additional strips at all points of differing terrazzo colours, adjacent differing materials, at all points in change of flooring direction etc.

 The flooring contractor is responsible to supply and install additional divider strips at intervals and spacing in full accordance with T.T.M.A.C. installation recommendations, so as not to exceed recommended unbroken floor areas. General spacing for divider strips to be 48" o.c. in both directions (4'-0" x 4'-0" grid) except where otherwise dictated/required for pattern purposes. Flooring contractor also responsible to provide and install divider strips immediately above all points of saw cuts in concrete sub-floor below.
 - .8 Slip sheet: 2 mil (25um) polyethylene film to CGSB Specification 70-GP-1, type 1.
 - .9 Curing compound: Type 11 non-staining to CGSB 90-GP-1. Moisture retention shall not exceed 0.015 grams
 - .10 Cleaners, sealers and floor finish: Terrazzo Tile and Marble Association of Canada Types 1001, 1002, 1003, 1004, 2001, 2002, and 3001, as applicable.
- 2.2 Mixes/Proportions
- .1 Underbed: one part of cement to four parts sand by volume. Wet and mix thoroughly. Generally use no more than 18 liters of water per bag of cement for underbed mix.
 - .2 Standard terrazzo topping: 40 kg bag of cement, and 90 kg of chips, mixed dry. Chip sizes, colour and percentage of mixtures as per Architect's approved sample. For floors, use no more than 18 liters of water per bag of cement.

PART 3 - EXECUTION

- 3.1 Preparation
- .1 Examination of surfaces: examine surfaces upon which the work of this section is to be installed and report any defects to the Architect prior to beginning work.
 - .2 Clean concrete slab. Remove laitance by wet grind or acid etch and rise thorough with clean water, or sand blasting, or steel shot blasting, or method approved by T.T.M.A.C.
 - .3 Underbed preparation: broom clean base slab. Fill all voids with loose sand. Apply slip sheet of 1 ply polyethylene film over sand. Lap joints 100mm.

3.2 Installation

Note:

Total thickness of floating terrazzo to be not less than 64mm thick throughout (including 16mm finished topping thickness on 48 mm of underbed, with wire reinforcing and polyethelene separation layer all on top of depressed structural concrete slab).

- .1 Underbed: Apply underbed and reinforcing mesh over prepared substrate and screed level making allowances for terrazzo topping. Permit underbed to cure minimum 24 hours prior to receiving terrazzo topping.
- .2 Divider strips: install divider strips in underbed while it is still in plastic state. Set strips true and level in accordance with required pattern, utilizing a typical 48" x 48" grid unless noted otherwise.

Divider strips are to be installed between all differing colours, and as required in intervals, spacings and configurations as recommended by the T.T.M.A.C. relative to the intended application.

3.3 Installation of Terrazzo Toppings

- .1 Standard Terrazzo Topping: after a minimum of 24 hours following installation of underbed, soak underbed, remove excess water and place a slurry consisting of cement and colour using same proportions as used for topping. Wet topping mixture, mix thoroughly and apply to underbed while slurry is still wet. Sprinkle topping with wetted marble chips using same formula used in topping mix, to ensure finished surface will consist of marble chips to match approved samples. Roll topping with heavy rollers to compact topping and remove excess water and cement. Hand trowel to level terrazzo topping with top of divider strips and cure.

Surface and grout terrazzo when it has set sufficiently hard. Surface by machine rubbing with No. 24 grit or finer abrasive blocks. Use plenty of water during grinding. Immediately following initial grinding, flush terrazzo surfaces thoroughly using water only and apply a grout to fill the voids. Mix grouts in same proportions as used in topping.

Allow grouted surface to cure for at least 48 hours and then re-surface by machine rubbing using No. 120 grit abrasive blocks and plenty of water.

Following removal of grout, scrub terrazzo thoroughly using machine scrubbers and ample clean water. Rinse terrazzo with clean water and then dry thoroughly. Apply coat of sealer as soon after cleaning as possible.

Apply sealer in accordance with manufacturer's written instructions. Wipe off excess water before it dries.

Apply second coat of sealer in same manner as first, but not until all other work is complete and terrazzo has been cleaned again as previously specified above. Apply two coats of surface finish.

- .2 Coved Terrazzo base: apply underbed with sufficient water to form a stiff mix. For terrazzo topping, omit sprinkling of surface chips and rolling specified for standard terrazzo topping. Base height to be 4" above finished floor unless noted otherwise. Form base with integral 38mm radius coved juncture with floor. Terrazzo at cove to be 10 mm topping on 13mm underbed. Carry all divider strips in floors into and up all coved terrazzo bases. Cap top of all coved terrazzo bases with continuous zinc capping strips to suit.

- 3.4 Patching
 - .1 Remove and replace all defective or damaged work promptly or when directed by Architect.
- 3.5 Cleaning and Sealing
 - .1 Cleaning and sealing shall be as recommended by the Terrazzo, Tile and Marble Association of Canada. All work to be executed by Terrazzo Contractor.
- 3.6 Protection
 - .1 Provide adequate protection to complete work until final acceptance. Protect work of other trades. Prohibit traffic during installation and for 48 hours after completion.

END OF SECTION 09401

PART 1 - GENERAL

- 1.1 General Division One, General Requirements, is part of this section and shall apply as if repeated here.
- 1.2 Description of Work Provide all labour, materials, and equipment required or called for in this specification, or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to the supply and installation of the following:
- .1 Removal and disposal of all existing flooring finishes [and related components] as required to accommodate newly specified flooring materials and finishing components.
 - .2 Resilient flooring materials (in types and formats as specified herein and as shown on the drawings)
 - .3 Rubber wall base (at all walls and/or the base of all millwork items as indicated on the Drawings)
 - .4 Resilient flooring transition strips (between resilient floors and dissimilar flooring finishes)
 - .5 Preparation of all existing floors and applicable substrates as required to ensure first-rate installation, adhesion and performance of new resilient flooring products specified herein. This work may include (without strict limitation to) removal of existing flooring and wall base; scraping and removal of existing sub-floor irregularities down to a smooth substrate; dustless diamond grinding of existing concrete floors as required; application of moisture-mitigation products; application of localized sub-floor fillers and isolated patching and repair of existing substrates to provide smooth and consistent finish for newly installed resilient flooring materials and related items specified herein.
- 1.3 Related Work
- .1 Demolition Section 02100
 - .2 Cast-in-Place Concrete Section 03300
 - .3 Steel Stud & Gypsum Board Section 09111
- 1.4 Maintenance Data
- .1 Provide data for maintenance of resilient tile flooring in accordance with Section 01730.
- 1.5 Maintenance Materials
- .1 Deliver 2 square meters of each colour, pattern and type of flooring material required for this project, for maintenance use, excluding sheet goods. Package and clearly identify each type. Deliver to Owner as directed.
 - .2 Maintenance materials to be same production run as installed materials.

- 1.6 Environmental .1 Maintain minimum 20° air temperature at flooring installation area for 3 days before, during and for 48 hours after installation.
- .2 Acclimate all resilient flooring and wall
- 1.7 Samples .1 Submit a 300mm x 300mm (12" x 12") sample of each colour and material indicated, including insets/accents as applicable. All samples are to be approved by the Architect prior to product ordering.

PART 2 - PRODUCTS

- 2.1 Materials .1 **QUARTZ TILE FLOORING [QT]:**
All quartz tile resilient flooring is to be installed in locations noted on the architectural drawings. Product to be:
- QT:
24" x 24"] X 2.0 mm thick Altro Quartz Tile in colour #9302 Rock Salt; product to be laid in half-offset brick pattern throughout
- .2 **RUBBER BASE (RB-#):**
All rubber base to be 4.25" high Tarkett 'Perceptions Recess' with toe in colours and locations noted on drawings. Product to be supplied in roll goods throughout and installed in longest practical lengths with seams only at inside corners.
- Product colour to be:
#179, Steel
- Base to be installed with Johnsonite #960 Adhesive on porous substrates and Johnsonite #945 Contact Base Adhesive on non-porous surfaces.
- Flooring trade to note requirement for rubber base on millwork items where shown on Architectural drawings.*
- .3 **Resilient Flooring Adhesives:**
- A) QT Adhesives @ Floors: to be as recommended by product manufacturer for the specific flooring material and intended application on applicable substrate (above, at, or below grade). *Ensure use of water-resistant [high moisture] adhesives for all on-grade applications.*

.4 Transition Strips & Protective Capping Strips:

Transition strips shall include all 'reducers', 'adaptors' 'slimline transitions' and/or 'wheeled traffic transitions' as manufactured by Tarkett (unless noted otherwise).

Transition strips are to be supplied and installed at all flooring transitions throughout where dissimilar flooring materials meet [unless noted otherwise]. Flooring trade to determine the required profile of the transition strips for the intended application, supplying and installing suitable transitions strips to:

- mediate/transition between new flooring of different thicknesses
- mediate/transition between a new flooring finish and an adjacent existing flooring finish which is not co-planar (i.e. with a different finish level)
- protectively cap seams between differing flooring materials/types of the same or differing thicknesses

Transition/Protection Profiles:

Flooring trade to select appropriate profiles from Tarkett's full product range suited to the intended application relative to abutting flooring types and thickness.

Transition Strip Colours:

Architect to select colours from Tarkett's full colour range.

.5 Sub-Floor Preparation Materials [Leveling and Patching]:

Flooring trade is responsible to prepare existing concrete floors as required for newly specified materials, ensuring that final installation of resilient flooring is free of calendaring and any evidence of substrate irregularities.

This may include the installation of subfloor treatment products including (without strict limitation to): subfloor primers, patching and skimcoat products, slope & deep fill products; dry-pack mortars, self-leveling (poured-on) underlayments etc. [as and where required throughout]. All sub-floor preparation materials are to be selected to suit to the intended application, substrate conditions, and manufacturer installation requirements for newly specified products outlined herein. All preparation materials utilized are to provide a lasting bond to the subfloor and are to support long-term use of the specified finished flooring products.

The flooring trade is responsible to coordinate subfloor preparation and installation requirements with flooring manufacturers, allowing for and providing all related materials and techniques herein.

All sub-floor preparation products are to be:

- fully bonded to substrate

- finished flush, level and smooth with surrounding subfloors
- fully compatible with both substrate material and the new newly specified floor finishes
- installed to provide a smooth and consistent finish for the finished flooring to be installed free of visible calendaring and sub-floor irregularities

Acceptable manufacturers for sub-floor preparation products include Mapei and Ardex.

.6 **Sub-Floor Moisture-Mitigation Barrier:**

Flooring trade is responsible to supply and install a moisture mitigation barrier below all resilient flooring products applied on any form of slab on or at grade. Typically this will include flooring on Ground Floor level only.

Moisture-mitigation systems shall be 2-part epoxy products, suitable for concrete substrates and newly specified flooring materials [noted herein]. Acceptable products include:

- Uzin PE 460
- Mapei Planiseal EMB
- Laticrete VaporBan Primer ER

Final selection of moisture-mitigation product shall be based upon moisture-testing results determine by 'in-floor' probes testing of the slabs.

PART 3 - EXECUTION

3.1 Sub-floor Assessment .1

Ensure concrete sub-floors are clean and dry, exhibiting negative alkalinity and no signs of efflorescence, carbonization, dusting, excess moisture levels and/or any other condition adversely impacting the integrity of the final flooring installation.

Moisture Testing:

Perform moisture testing on sub-floors as recommended by flooring manufacturer relative to the intended application. Topical moisture tests are not acceptable. All sub-floor moisture tests shall be conducted using in-floor probes. Probe locations and quantities to be as recommended by the flooring manufacturer.

Wherever sub-floor moisture test results do not conform to manufacturer's standards, assess available options with Client including:

- use of moisture-resistant adhesives [as/if specified]
- installation of moisture mitigation membranes [of varying types suited to the intended installation] prior to installation of flooring

- 3.2 Sub-floor Preparation
- .1 Remove sub-floor ridges and bumps. Remove residue from any previous materials and/or finishes. Grind down to even surface where necessary. As required, provide dustless diamond grinding (via commercial dustless diamond grinder) to ensure flatness and smoothness of substrate free of irregularities.
 - .2 Clean floors and substrates to remove all dust and irregularities which might adversely affect the work. Ensure use of suitable cleansing agents for areas of oil or other contaminants on the sub-floor surface. Rinse all cleansing agents from the floor to with clean water to ensure that no residue remains.
 - .3 Fill all low spots, dishings, cracks, joints, holes and other inset irregularities in the sub-floor, choosing a patching, skimming, levelling or filler agent as required related to each subfloor irregularity. Utilize primers where necessary to ensure proper bond. Trowel and float filler agents as required to leave a smooth, hard surface once cured. Sand or grind cured fillers where required. Ensure that all filling materials provide a smooth, consistent and flat finish which is permanently bonded to the subfloor.
- 3.3 Environmental Acclimation
- .1 All resilient flooring products (including both sheet and tile products) are required to acclimate to ambient indoor temperatures within related installation spaces (at temperatures between 65°F and 75°F for a min. 72 hours prior to installation). Ensure that all resilient flooring materials are installed in full accordance with the manufacturer's environmental conditions throughout.
- 3.4 Resilient Tile Installation
- .1 Apply adhesive uniformly using recommended trowel type [and notch dimensions] in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place. All tile must be installed prior to adhesives 'setting-up' and curing in order to promote optimal and lasting bond.
 - .2 All tile installation patterns, colours and locations are to be as per Architectural drawings and Colour and Finish Schedule.
 - .3 ***Verify installation orientation of all resilient flooring products with Architect prior to installation.***, particularly for resilient flooring products which are 'directional' (i.e. have a distinct visual 'grain' running in a single direction).

Unless noted otherwise, square-format resilient floor tile is to be installed in each room with all tiles (and visual 'grain' thereon) running in a single direction throughout. Quarter-turned (tessellated) tile installations will ***not*** be accepted. Installation orientation is to be as indicated on architectural drawings and/or as directed by the Architect.

- .4 Unless noted otherwise, install tile flooring in half offset brickwork pattern with all lines aligned and parallel to building lines wherever possible. All joints between tiles to be tight and free of gaps, ensuring same is true at patterned installations throughout.
 - .5 Double-cut any patterned installations involving angles or curves using plywood scribing templates to suit.
 - .6 Cut and fit neatly around fixed or excessively heavy objects.
 - .7 Install flooring in removable floor access covers where applicable) maintaining floor pattern.
 - .8 Terminate flooring at centerline of door (where possible) in openings where adjacent floor finish or colour is dissimilar.
 - .9 Roll all installed products with commercial flooring roller as recommended by flooring product manufacturer to remove air bubbles below flooring and to ensure that all product lays flat and true, free of any lifting edges and irregularities throughout.
- 3.4 Base Installation
- .1 Set base in adhesive tightly against wall and floor surfaces. Use lengths as long as practical and not less than 500mm (20") long.
 - .2 Install straight and level to variation of 1:100.
 - .3 All base products are to be installed in full accordance with manufacturer's recommendations, including scribing details at all interior and exterior corners. Fit base goods neatly to all doorframes. All short returns of base goods (and at any locations where base product may not sit firmly against wall surface), base to be secured in place with construction adhesive or contact cement adhesive, sufficient to ensure full adhesion.
- 3.5 Protection of Finished Work
- .1 Prohibit traffic on floor for 48 hours after installation.
 - .2 Where floors are to be subject to traffic before final inspection, provide suitable protection following installation of initial wax and seal by flooring trade.

END OF SECTION 09660

PART 1 - GENERAL

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| 1.1 | General | Division One, General Requirements, is part of this section and shall apply as if repeated here. |
| 1.2 | Description of Work | <p>Provide all labour, materials, and equipment required or called for in this specification, or which is necessary to complete the work without any extra cost. This work may require, without strict limitation to the following (at the building interior and/or exterior):</p> <ul style="list-style-type: none"> .1 Priming and painting of interior masonry, gypsum board, cement plaster, plaster and other surfaces as indicated on Drawings and Schedules. .2 Finish priming and painting of steel doors and frames, and other non-prefinished metal components including priming and finish painting of all miscellaneous steel items contained within the Architectural and related Engineering drawings. .3 Staining and topcoating or other finishing of all wood and wood veneer items (including trimwork, wood perimeter of plastic laminate doors, hardwood veneered cabinetry etc.) as applicable. .4 Painting and/or priming (as required) of all new non-prefinished miscellaneous metal items (convector cabinets, fire-hose cabinets, access hatches) etc. .5 Re-painting and/or priming (as required) of existing metal items (convector cabinets, fire-hose cabinets, access hatches) etc. specified for new paint finish. .6 Painting of exposed metal ducts, grilles, louvers and related equipment as indicated on the drawings and schedules. .7 Painting of steel structural items throughout. .8 Painting of miscellaneous non-prefinished steel and metal items (bench supports, countertop supports, lintels etc.) .9 Complete preparation of existing painted surfaces (specified for re-paint) including all related sanding, scraping, and removal of loose existing paint, testing of existing paint (for determination of compatible paint formulations), and priming of all existing surfaces (following Preparation) prior to re-painting as specified. .10 Other associated work as indicated on drawings and schedules, including painting of hardboard stage flooring. |
| 1.3 | Related Work by Others | <ul style="list-style-type: none"> .1 Shop priming structural steel Section 05120 .2 Shop painting miscellaneous metals Section 05500 .3 Steel Doors & Frames Section 08100 .4 Metal Stud and Gypsum Board Section 09111 .5 Concrete Masonry Units Section 04220 .6 Sealants Section 07900 |

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| 1.4 | Requirements of Regulatory Agencies | .1 | All finishes shall meet the flame spread and smoke development requirements of the Ontario Building Code for the specific location and application for all parts of the Work. |
| 1.5 | Environmental Requirements | .1 | Apply finishing materials only when air and surface temperatures have reached the minimum level recommended by the manufacturer's specification for each product, and have been maintained at this temperature for a minimum of 24 hours. |
| | | .2 | Do not apply exterior finish in direct sunlight that raises surface temperatures above that for proper application and drying, nor in rainy, foggy or windy weather. |
| | | .3 | Do not apply finishes when relative humidity is over 50%, when condensation has formed or is likely to form, nor immediately following rain, frost or dew. |
| | | .4 | Do not apply paint where moisture content, in gypsum board, pipe insulation or wood is above paint manufacturer's recommended maximum allowances. Confirm results of moisture test with Architect before proceeding. |
| | | .5 | Do not apply paint finish in areas where dust is being generated. |
| 1.6 | Colours and Samples | .1 | All colours shall be as scheduled by the Architect on the Colour and Finish Schedule or as specified herein. |
| | | .2 | Paint samples shall be prepared as directed by the Architect in accordance with Section 01340 and 1.11 of Section 09900. All site work on site must be completed to match approved sample. All product mixing and work on-site must be preceded with Architect's approved samples for paint & stain, lacquer and varnish, etc.

Acceptable paint and stain samples include 8" x 11" (minimum) sample size. Only "draw down" samples of actual paints will be accepted for paint colours. Minimum requirements are 2 draw down samples per paint colour per different paint product and per different paint finish. Stain samples to be applied to wood sample of wood species specified for use in the project. |
| 1.7 | Cooperation with Others | .1 | This contractor shall examine all drawings and specifications of all trades throughout the building for information affecting the work of this trade. |
| 1.8 | Plant and Scaffolding | .1 | The contractor shall provide all plant and scaffolding necessary for proper and efficient performance of the work. |
| 1.9 | Field Quality Control | .1 | Arrange for periodic visits to site by paint manufacturers' representatives while work is in progress. On each visit he shall verify that specified materials and methods are used, and that procedures agreed upon at the initial site meeting are followed. |

- 1.10 Product Delivery, Storage and Handling**
- .1 Deliver to site each container sealed and labeled with manufacturer's name, catalogue number or brand name, colour, and formulation type, reducing instructions, and reference standard specification number if applicable
 - .2 Store materials on site, and in an area specifically set aside for purpose, that is locked, ventilated, maintained at a temperature of over 4 degrees C (40 degrees F) and protected from direct rays of sun.
 - .3 Ensure that health and fire regulations are complied with in storage area. Provide carbon dioxide fire extinguishers of 9 kg (20 lbs.) minimum capacity in each storage area while materials are contained within.
 - .4 On each container, for materials requiring a fire hazard classification, attach an Underwriter's label verifying that the material is listed under their label service, and giving the hazard classification.
- 1.11 Protection**
- .1 Cover or mask surfaces adjacent to those receiving treatment and finishing to protect work of others from damage and soil. Mask instruction and specification plates attached to equipment being painted.
 - .2 Take particular care in storage and mixing areas that floors are protected by tarpaulins and metal pans.
 - .3 Place cloths and other disposable finishing materials, that are a fire hazard, in closed metal containers containing water, and remove from building every night.
 - .4 Coordinate with the appropriate trades for the removal from finished surfaces, storage and reinstallation after finish work is completed of finish hardware, switch and receptacle plates, escutcheons, luminaries frames, and similar items.
 - .5 Post "No Smoking" signs and ensure that spark-proof electrical equipment is used in areas where flammable painting materials are being applied.
 - .6 Post "Wet Paint" signs throughout freshly finished areas and remove when finishes are dry.
- 1.12 Colour and Product Fidelity and Finish**
- .1 Draw Down samples of each paint colour and paint sheen for each different paint product must be approved by the Architect prior to installation. The Contractor will retain 1 full set of the approved samples on site and is responsible to verify the application of the proper colours and products throughout the project. The Architect reserves the right to enforce full conformance of the finished work to the approved samples and specified products as shown on drawings, Schedules, Addenda's, and all Contract Documents. Any colours or products which the Architect deems unsuitable due to lack of colour or sheen fidelity, improper application, poor workmanship or any conditions not in strict accordance with the Contract Documents will be rectified by the Painting Contractor to the full satisfaction of the Architect in accordance with the Contract Documents at no cost increase.

PART 2 - PRODUCTS

- 2.1 Paint Materials .1 Painting materials such as primers, paints, rust-inhibiting agents, stains, fillers, varnishes, lacquers, etc., to be supplied by Benjamin Moore, Sherwin Williams or ICI/Dulux only. All paint to be highest professional/commercial grade products available from each manufacturer as prescribed in PART 3 below, relative to the intended application. Only OPCA/CPCA/CGSBQ approved equivalents within the noted manufacturers will be accepted.
- Painting contractors must inform the Architect in writing which product line he intends to use and is to receive approval prior to mixing. Selection of final product line is completely at the Architect's discretion and the Architect reserves the right to select any of the specified product lines at no cost increase.
- .2 All materials to be the highest professional/commercial grade available from the manufacturer for each finish type, to meet or exceed CGSB Specifications, as outlined in PART 3 herein.
- .3 Materials for application of each finish type shall be products from a single manufacturer.
- .4 Materials such as putty, linseed oil, shellac, turpentine, etc., shall be pure, or of the highest quality produced or recommended by the paint manufacturer, and bear an identifying label on the container.
- .5 Gypsum Board patching compound: Resurfo by Reardon or alternate.
- .6 Specialty Paint at Stage Hardboard Flooring:

PART 3 - EXECUTION & INSTALLATION

- 3.1 Paint Colours .1 All paint/pigment colours and locations to be in full and strict accordance with Architect's drawings, Room Finish Schedule and Colour Finish Schedule. Any areas or items requiring paint finishes which appear unclear or which are insufficiently documented, are to be reported to the Architect for direction prior to paint mixing and installation. Any site work relative to such items undertaken by the Contractor or trades without the consultation of the Architect is the sole responsibility of the Contractor and is subject to further rectification of the work for unacceptable materials, colours, or finishes, as per the Architect's direction, at no cost increase.
- .2 Except where noted otherwise within the Contract Documents, and excluding those surfaces featuring painted wall graphics, the Architect reserves the right to select any number of paint/pigment colours for each room, up to one individual colour per wall surface/wall plane (or ceiling surface/ceiling plane), at no cost increase. This applies only to wall and ceiling surfaces and excludes trims and other architectural features thereon. For all other architectural items associated with the walls, floors, ceilings, etc. in each room, the Architect reserves the right to select another paint colour differing from that of the adjacent surfaces at no cost increase. All paint colours to be noted on Colour/Finish Schedule (issued post-Tender).

- 3.2 Examination
- .1 Verify that specified environmental conditions are ensured before commencing work.
 - .2 Ensure that surfaces to receive finishing materials are satisfactory for specified materials and will not adversely affect execution, permanence, or quality of work.
 - .3 Maintain on site at all times until work is completed a moisture meter, hygrometer and thermometer to verify surface and environmental conditions. Test all surfaces for moisture content with an electronic moisture meter, and concrete, masonry, exterior insulation and finish systems, plus plaster surfaces for acid alkali balance with appropriate equipment and procedures.
- 3.3 Mixing
- .1 Unless specified otherwise paints shall be ready-mixed. All catalyzed products to be mixed on site to as required to provide a uniform and optimal finish quality.
- 3.4 Workmanship
- .1 All work must be executed by skilled, experienced mechanics under the direction of a competent foreman. All paint and enamel shall be evenly spread, and no coat shall be applied until the previous coat is perfectly dry.
 - .2 All products are to be applied in full accordance with the paint manufacturer's recommendations, including surface preparations, recommended application tools, techniques, intermediate drying times, etc. All products are to be applied in full accordance with the manufacturer's maximum recommended dried film thicknesses (dft) throughout.
 - .3 There shall not be any drips or runs of materials. The woodwork shall be well-rubbed down before the first coat and between all coats. All work shall be to the satisfaction of the Architect.
 - .4 Brush on all painting materials covered by this division, except where noted in 3.4.8 below. If this contractor wishes to spray certain surfaces, obtain prior approval from the Architect. Apply painting materials evenly and smoothly.
 - .5 Sand and dust between each coat to remove defects visible from distance up to 1.0m (3' -0").
 - .6 Finish bottoms, tops, edges and sides of all doors, including returns to cutouts where applicable.
 - .7 In the opinion of the Architect, the number of coats of paint specified should produce a superior finish. However, if more coats than the number specified are required to meet the approval of the Architect, they shall be supplied and applied at no extra charge. Painting contractor may be required to verify dry film thickness (dft) of any products applied under this Section, at no cost increase.

- 3.5 Preparation
- .1 All surfaces or materials to receive paint finish are to be prepped in full accordance with the finish manufacturer's specifications relative to the material substrate, using the finish manufacturer's recommended products. It will be assumed by the Architect that any improperly adhering paint finishes are the result of inadequate preparation or improper application and are subject to full rectification at no cost increase.
 - .2 Touch-up shop painted primer on steel with approved primer. Tint filler to match stains for stained woodwork.
 - .3 Prepare galvanized steel and zinc coated surfaces with one coat of copper sulfate solution in water (1:16 proportion).
 - .4 Prepare exposed concrete, plaster, and masonry to make free of dust, dirt, grease, loose mortar on face, etc. Apply filler to concrete block of sufficient density to eliminate pinholing.
 - .5 Interior gypsum board to be prepared by cutting out minor imperfections, such as scratches, cracks, abrasions in surface, and filled with patching compound; sand smooth when dry. Seal before prime coat application.
 - .6 Prepare wood finishes (designated for stain and/or clear topcoat finish) by applying matching (or stainable) wood filler to suit, at nail holes, gaps, cracks and imperfections, blending filled spots with adjacent surfaces. Sand all filler smooth and flush with adjacent surface, applying in multiple coats as required. Ensure that all wood is adequately sanded and free of contaminants which may adversely affect quality and consistency of subsequent stain and/or topcoat finishes.
 - .7 **PREPARATION of PREVIOUSLY COATED SURFACES:**
Painting Contractor to investigate all previously coated surfaces to determine necessary requirements to ensure proper adhesion and formulation compatibility of newly specified paint finishes throughout.

Existing painted surfaces (specified to be re-painted) are to be tested with methyl-hydrate to determine if they are alkyd or water-based materials to determine compatible formulation of new paint materials.

All existing coatings are to be properly cleaned, scraped and prepared for re-coat to ensure full and lasting adhesion of new paint finish. Preparation shall include any form of mechanical abrasion required (sanding, scraping, sandblasting, shot-blasting etc.) to remove peeling and/or loose paint finishes to ensure a proper and lasting bond of new paint finish.

Existing clear top-coated surfaces (varnish, polyurethane, oil-based or water-based clearcoats etc.) are to be properly scraped, sanded and de-glossed as required to remove any topcoats which are not fully adhered to their substrate.

Supply and install new high-adhesion bonding primers, stain-blocking primers and/or sealant primers as required prior to repainting. Bonding primers should be selected to ensure adhesion and performance of the final paint finish. Non-waterbased primers are acceptable to ensure adhesion throughout.

- 3.6 Mechanical and Electrical Equipment
- .1 Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment in and adjacent to finished areas. Colour and sheen to match adjacent surfaces.
- .2 Paint both sides and all edges of plywood backboards for electrical equipment before installation. Leave equipment in original finish except for touch-up as required.
- 3.7 Exterior Coatings
- The items noted in this section below are provided for reference as/if required.*
- .1 Exposed Steel Lintels, Non-prefinished metal louvres, and All Miscellaneous unfinished Steel Items:
- 1 coat Sherwin Williams PRO CRYL Universal Primer B66-1310 Series
 - 2 coats Sherwin Williams "Waterbased Alkyd Urethane Enamel" topcoat, B53 Series, Low-Sheen finish
- .2 Exterior Steel Door Frames & Sidelight:
- 1 coat Sherwin Williams PRO CRYL Universal Primer B66-1310 Series
 - 2 coats Sherwin Williams "Waterbased Alkyd Urethane Enamel" topcoat, B53B Series, Semi-gloss finish [spray applied finish where practical doors]
- .3 Exterior Hollow Structural Steel Posts [HSS-P] below new Entrance Canopy:
- 1 coat Sherwin Williams PRO CRYL Universal Primer B66-1310 Series
 - 2 coats Sherwin Williams "Corothane I Mio-Aluminum" matt leafing-aluminum topcoat (spray applied) in natural aluminum colour
- .4 Miscellaneous Ferrous Metals:
- 1 coat Sherwin Williams "Kem Bond Hi-Solids" Universal Metal Primer (alkyd); VOC compliant
 - 2 coats Sherwin Williams "Industrial Enamel Urethane" topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant
- .5 Miscellaneous Galvanized Items:
- 1 coat Sherwin Williams "Galvite HS" acrylic primer, B50 WZ30 Series, spray applied
 - 2 coats Sherwin Williams "Industrial Enamel Urethane" topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant

3.8 Interior Coatings

It is the intention that various (existing) interior [previously painted] surfaces are to be re-painted as part of this scope of work. These items are identified on the Architectural drawings and the related Room Finish Schedule.

Whether or not expressly noted below, it is required that all items to be repainted are to be prepped in accordance with Section 3.5 (Preparation), using additional products (as required) including suitable bonding primers and/or sealing primers (such as Sherwin Williams 'Extreme Bond - Bonding Primer', Benjamin Moore Insul-X Bonding Primer', Zinsser 'Bullseye Shellac Bonding Primer' and/or similar products). Primers to be selected specific to individual application requirements based upon site conditions and previous paint formulations being re-painted.

Primers noted below apply to new wall materials only. Substitute primers as required for re-coat applications on existing wall surfaces.

- .1 Concrete Block:
 - 1 coat Sherwin Williams "Heavy Duty Block Filler" B42W150 Series
 - 2 coats Sherwin Williams "Pre-Catalyzed Waterbased Epoxy" Egg Shell finish, K-45 Series
- .2 Gypsum Wall Board Walls - Paint Finish
 - 1 coat Sherwin Williams "Promar 200' 0-VOC latex primer, B28W2600 Series
 - 2 coats Sherwin Williams abrasion resistant "Duration Interior Latex" A98 Series or Dulux "Diamond Interior 100% Acrylic", satin finish
- .3 Gypsum Wall Board Ceilings/Bulkheads - Paint Finish:
 - 1 coat Sherwin Williams "Promar 200 Zero-VOC" latex primer, B28W2600 Series
 - 2 coats Sherwin Williams "Promar 200 Zero VOC" Interior Latex Paint, flat finish, B30-2600 Series
- .4 Steel Door and Frames and All Miscellaneous Non-prefinished Steel Items (u.n.o.) - Paint Finish:
 - 1 coat Sherwin Williams PRO CRYL Universal Primer B66-1310 Series
 - 2 coats Sherwin Williams "Waterbased Alkyd Urethane Enamel" topcoat B53-Series, semi-gloss finish
- .5 Galvanized and Zinc coated Metals - Paint Finish:
 - 1 coat Sherwin Williams PRO CRYL Universal Primer B66-1310 Series
 - 2 coats Sherwin Williams "Waterbased Alkyd Urethane Enamel" topcoat B53-Series, semi-gloss finish
- .6 Repainted Hollow Metal Doors, Door Frames and Glazing Screen frames (as applicable):
 - 1 coat Sherwin Williams 'Extreme Bond Bonding Primer' B51WQ1150 series
 - 2 coats Sherwin Williams "Waterbased Alkyd Urethane Enamel" topcoat B53-Series, semi-gloss finish

- 3.10 Touch-Up & Cleaning**
- .1 Touch up and finish visible defects in the work. Refinish entire wall, ceiling or finished surface where substrate and/or finish is significantly damaged or not deemed acceptable by the Architect.
 - .2 Remove all overspray paint or similar finish from prefinished or unpainted items throughout. Clean and remove any paint overspray of one colour on a painted surface of dissimilar colour or finish. Repaint and restore finishes as required to blemish-free state.
 - .3 Leave storage and mixing areas clean and in same condition as adjacent spaces in project.

END OF SECTION 09900

PART 1 - GENERAL

- | | | | |
|-----|----------------------------|--|---|
| 1.1 | General | Division One, General Requirements, is part of this section and shall apply as if repeated here. | |
| 1.2 | Description of Work | Provide all labour, materials, and equipment required or called for in this specification, or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to any of the following: | |
| | | .1 | Supply and installation of all white boards indicated as 'WB' on Architectural floor plans, and/or as illustrated on interior elevation drawings. White board sizes, locations and quantities are to be as indicated on the Architectural drawings. |
| | | .2 | Supply and installation of all tack boards indicated as 'TB' on Architectural floor plans, and/or as illustrated on interior elevation drawings. Tack board sizes, locations and quantities are to be as indicated on the Architectural drawings. |
| 1.3 | Related Work | .1 | Rough Carpentry Section 06100 |
| | | .2 | Finish Carpentry Section 06200 |
| | | .3 | Millwork Section 06400 |
| | | .4 | Steel Stud & Gypsum Bd. Section 09111 |
| 1.4 | Shop Drawings | .1 | Submit shop drawings showing sizes, trim profiles etc., in accordance with Section 01340. |

PART 2 - PRODUCTS

- 2.1 Whiteboards**
- .1 All whiteboards/marker boards shall be as manufactured by ASi Visual Display Products Series 9800 or Global School Products, consisting of a sandwich type construction composed of face panel, core and rear balancing steel. Product surface to be suited to projection from overhead short through projectors mounted above board and for use of dry-wipe markers from face.
 - .2 Writing face to be white porcelain enamel coating fused to steel backing.
 - .3 Core 11.1mm (7/16") impregnated fibreboard laminated under heat and pressure to face panel and back sheet using adhesives that ensure no joint failure of the contact surfaces.
 - .4 Backing (balancing) sheet to be 28 gauge zinc coated stretcher steel leveled in one unjointed section. Overall thickness of whiteboard to be 12.7mm (½").
 - .5 Aluminum trims as noted in 2.2 below.
- 2.2 Aluminum Trim**
- .1 Except where noted otherwise, aluminum trim to be Series 800 by ASi Visual Display Products or Global School Products. Aluminum to be 6063T5 alloy with clear etched and anodized 0.051mm (.002') satin finish free from extruding draw marks and surface scratches. All whiteboards to be supplied with full perimeter trims and accessories, as specified below.
 - .2 Marker tray: Series 800 complete with contour fitting end caps and castings by ASi Visual Display Products or Global School Products. Provide 1 marker tray at full bottom perimeter of each whiteboard.
- 2.3 Tackboards**
- .1 All tackboards shall be 12.7mm (1/2") factory prelaminated units consisting of 6mm (1/4") thick ASP Natural cork laminated to 6mm (1/4") particle board or masonite substrate as manufactured by ASi Visual Products or Global School Products. Units to be fabricated under mechanical pressure available in sizes up to 1219mm x 2438mm (4' -0" x 8' -0"). Unit dimensions as per Architect's drawings. Natural cork colour throughout. Bonding of materials by waterproof adhesive that will not delaminate or rupture at the contact surfaces. Finished unit to be trimmed all around with clear aluminum perimeter trim as note in 2.4 below.
 - .2 All tackboards shall meet the minimum requirements of the applicable building code and/or Ontario Fire Marshal's office.

- 2.4 Fabrication .1 Fabricate panels to sizes as indicated on Architectural drawings and details shown therein. Site procession of panels is to be carried out in strict accordance to manufacturer's recommendations.

PART 3 - EXECUTION

- 3.1 Installation .1 Install boards plumb and level in accordance with manufacturer's instructions and specifications, to provide rigid, secure surface.
- .2 Install trim and framing around all tackboard panels. Make intersecting joints to hairline fit, free of rough edges. Use concealed brackets throughout, and to reinforce and hold joints tight and flush. No exposed fasteners permitted. Overlap trim 6mm onto panels.
- .3 Use surface fasteners of following types, except where specified type is indicated.
- (a) To hollow masonry, plaster and panel surfaces use toggle bolt.
 - (b) To solid masonry and concrete use expansions shield with lag screw, jut fibre or lead plug with wood screw.
- 3.2 Cleaning .1 Clean all surfaces after installation using manufacturer's recommended cleaning procedures.

END OF SECTION 10120

FLAGPOLE

Section 10350
Page 1 STCES
2316

PART 1 - GENERAL

- | | | | | |
|-----|------------------------|----|--|---------------|
| 1.1 | Description
of Work | .1 | Supply and install Flagpole. | |
| | | .2 | One Flagpole required. | |
| 1.2 | Related
Work | .1 | Concrete foundation | Section 03300 |
| 1.3 | Shop Drawings | .1 | Submit shop drawings in accordance with Section 01340. | |

PART 2 - PRODUCTS

- | | | | | |
|-----|---------------|--|--|--|
| 2.1 | Manufacturers | | Flagpole to be as manufactured by Ewing Flagpoles or approved equivalent. | |
| 2.2 | Materials | | Flagpole shall be Model S.T.A., 25' - 0" high pole, with fixed base #B5, econoline internal halyard system. Finish shall be clear anodized aluminum. | |

PART 3 - EXECUTION

- | | | | | |
|-----|--------------|----|--|--|
| 3.1 | Examination | .1 | Ensure fixed base is level before erecting flagpole. | |
| 3.2 | Installation | .1 | Erect work straight, plumb, level, and secure to foundation as provided under Section 03300. | |

End of Section 10350

FINISHING HARDWARE SPECIFICATION

FOR
ST. THERESE C.E.S.
ALTERATIONS
530 KILLALY ST. EAST
PORT COLBORNE, ON

ARCHITECT: WHITELINE ARCHITECTS INC
83 ONTARIO STREET
ST. CATHARINES, ON
L2R 5J5

CONTRACTOR:

SUPPLIER:



GROUP 87

ARCHITECTURAL HARDWARE INC.

UNIT #1 – 3245 HARVESTER RD,
BURLINGTON, ONT. L7N-3T7

PH# 905-639-4676

FAX# 905-639-7561

E-MAIL: glen@group87.ca

WEB: www.group87.ca

CONSULTANT: **GLEN C. WIKKERINK**

DATE: April 15, 2024

REVISION:

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Supply of finishing hardware as listed in the hardware schedule, 3.06
2. Supply of bolts, screws, expansion shields and special fastening devices required to properly install finishing hardware.
3. WHITELINE ARCHITECTS INC

B. Related Sections:

1. Installation of finishing hardware.
2. Metal doors and frames.
3. Wood doors.
4. Roll-up doors and fire shutters.
5. Aluminum door hardware.
6. Toilet partition hardware.
7. Miscellaneous specialties.
8. Power connection to automatic door operators. Provision of conduit between operators and activators, power connection to electric hold open devices, section 16000.

1.02 REFERENCES

1. Hardware for Labeled Fire Doors.
2. N.F.P.A. 80. Fire Doors and Windows.
3. N.F.P.A. 101. Life Safety Code.
4. N.F.P.A. 105. Installation of Smoke Control Door Assemblies.
5. Ontario Building Code.

1.03 SUBMITTAL

1. Make submittal in accordance with section 01340.
2. Prepare a detailed finishing hardware schedule itemizing each opening. List all doors by number including size, hand, swing and any and all relevant details effecting the application of finishing hardware.
3. Submit catalogue cuts of all proposed hardware.
4. Submit samples for approval as required.
5. Submit template information to the General Contractor for preparation of product in related sections' and installation of finishing hardware.
6. Prepare for review a detailed key schedule.
7. Submit wiring diagrams and a description of operation for electrified hardware systems specified.
8. Upon job completion, submit to the owners two 'Owners Operation and Maintenance Manuals' containing the following information:
 1. Maintenance instructions for each item of hardware.
 2. Final Hardware Schedule.
 3. Final Keying Schedule.

1.04 QUALITY ASSURANCE

1. Proposed substitutions must be approved by the Architect prior to submission of tender.
2. The hardware supplier must be regularly involved in supplying and expediting contract hardware for projects of this nature. The supplier must employ a certified **"Architectural Hardware Consultant"** to co-ordinate and oversee scheduling, ordering and the supplying of finishing hardware.

1.05 DELIVERY, STORAGE AND HANDLING

1. Hardware is to be delivered to the site in the Manufacturers original packaging. Each item of hardware to be clearly marked with the door number and item number corresponding to the approved hardware schedule. The General Contractor shall receive, check and be responsible for all items of hardware delivered to the jobsite.
2. Hardware supplier to co-ordinate delivery of hardware to the site or to the appropriate parties as noted in section 1.01.B "Related Sections" for installation.
3. Prior to delivery to the jobsite, a dry, secure room is to be provided for storage of the finishing hardware.

1.06 WARRANTY

1. Provide a minimum one year warranty for finishing hardware.
2. Provide a minimum ten year warranty for door closers.
3. Warranty to commence from date of Substantial Completion.

1.07 MAINTENANCE

1. Provide three wrenches for door closer adjustment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- | | |
|------------------------------|--|
| 1. Hinges | Ives |
| 2. Exit Devices | Von Duprin |
| 3. Locksets | Schlage Lock Co. |
| 4. Cylinders | Schlage Lock Co. |
| 5. Door Pulls | Standard Metal |
| 6. Door Closers | LCN Closers |
| 7. Overhead Stops | Glynn-Johnson |
| 8. Push, Kick, Armor Plates | Standard Metal |
| 9. Floor, Wall Stops | Standard Metal |
| 10. Thresholds, Weatherstrip | KN Crowder |
| 11. Auto Door Operators | Supplied & Installed by Horton Automatics |

GROUP 87 ARCHITECTURAL HARDWARE INC.

2.02 MATERIALS

1. All hardware shall be supplied complete with the necessary screw, bolts and other fasteners so as to anchor in position all finishing hardware to the Consultants approval. Exposed fasteners to be finished to match hardware. When a door pull is utilized on one side of the door and a push plate on the other, the plate is to be applied so as to conceal the door pull fasteners.

2. Hinges:
Specified: Five knuckle 5BB1 series by Ives
Acceptable Substitute: Five knuckle BB179 series by Hager

3. Continuous Hinges
Specified:
Acceptable Substitute:

3. Locksets:
Specified: Grade one lever, 11 Line Sargent
Acceptable Substitute: **None**

4. Exit Devices:
Specified: 8800 series by Sargent
Acceptable Substitute: **None**

5. Door Closers:

Specified: 1461 series by LCN
Acceptable Substitute:

Specified: 4040XP LCN
Acceptable Substitute:

6. Overhead Stops:
Specified: GJ90 series by Glynn Johnson
Acceptable Substitute:

GROUP 87 ARCHITECTURAL HARDWARE INC.

2.03 FINISHES

- | | | |
|----|----------|-----------------------|
| 1. | 15/652 | SATIN NICKEL |
| | 28 | ANODIZED ALUMINUM |
| | 26D/ 626 | SATIN CHROME |
| | 32D/630 | SATIN STAINLESS STEEL |
| | 689 | ALUMINUM PAINTED |
| | AL | ALUMINUM |
| | PT | PRIMED FOR PAINT |

2.04 KEYING

1. All locks to be keyed to be keyed alike, Sargent small format I/C core
2. Provide 2 control keys and 2 keys per cylinder.

PART 3 - EXECUTION

3.01 EXAMINATION

1. Size and condition of opening shall be verified as to door frames being plumb and of correct tolerance to receive doors and hardware. [General Contractor]

3.02 INSTALLATION

1. Review proper mounting heights with the Architect and/or Owner.
2. Standard mounting heights [unless otherwise noted]
 - A. Locks/Latches 40-5/16" to centre line of strike from finished floor.
 - B. Deadlocks 48" to centre line of strike from finished floor.
 - C. Exit Devices 40-5/16" to centre line of strike from finished floor.
 - D. Door Pulls 42" to centre line of pull from finished floor.
 - E. Push Plate 45" to centre line of Push Plate from finished floor.

The above noted mounting heights are a recommended standard and may vary under special applications and conditions.

3.03 FIELD QUALITY CONTROL

1. After installation of hardware, inspect the installation and certify that the hardware is correctly installed and in accordance with the Manufacturers recommendations.

3.04 ADJUSTING AND CLEANING

1. Upon final completion the hardware is to be left clean and free from defect. Hardware found defective is to be repaired or replaced.
2. All door closers are to be inspected for proper installation and adjustment. Provide a written report from the Manufacturers Representative confirming proper door closer installation and submit the report to the Architect.

3.05 PROTECTION

1. Contractor shall provide proper protection of hardware until turned over to the Owner.

3.06 HARDWARE SCHEDULE

1. Provide hardware in accordance with the schedule as follows:

LEGEND

AL	ALUMINUM
CLSR	CLOSER
DR	DOOR
DS	DEAD STOP
HLDR	HOLDER
HM	HOLLOW METAL
HW	HEAVY WEIGHT
LBR	LESS BOTTOM ROD
MNT	MOUNT
MTG	MOUNTING
NRP	NON REMOVABLE PIN
P.A.	PARALLEL ARM
WD	WOOD

FINISHES

15/652	SATIN NICKEL
28	ANODIZED ALUMINUM
26D/ 626	SATIN CHROME
32D/630	SATIN STAINLESS STEEL
689	ALUMINUM PAINTED
AL	ALUMINUM
PT	PRIMED FOR PAINT

MANUFACTURERS

HINGES	IVES
LOCKSETS	SARGENT
EXIT DEVICES	SARGENT
DOOR CLOSERS	LCN
OVERHEAD STOPS	GLYNN-JOHNSON
FLATWARE	STANDARD METAL
DOOR PULLS	STANDARD METAL
FLOOR/ WALL STOPS	STANDARD METAL
THRESHOLDS	K.N. CROWDER
WEATHERSTRIP	K.N. CROWDER
OPERATORS	HORTON - SUPPLIED & INSTALLED

Door Index

Door No	Hdg	Door No	Hdg	Door No	Hdg
D01	01				
D02	02				
D101-1	03				
D101-2	03				
D101A	04				
D102	05				
D103	06				
D103B	07				

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Heading 01 (HwSet)

1 PR DOOR(S) D01 EXTERIOR FROM LOBBY 1.01
 2/3'6" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD
 Opening Remark: PAIR OF DOORS - BOTH ACTIVE

Degree
 Hand Act InAct
 LHR 90 90

Totals	Each Assembly to have:					Act	InAct
(8)	8 EA HINGE	5BB1HW 5" X 4.5" NRP	630	IVE		4	4
(1)	1 EA REM. MULLION	42-7-CNI-TR	689	MIS		1	1
(2)	2 EA EXIT DEVICE	16-737P-8888J	32D	SAR		1	1
(2)	2 EA DOOR PULL	3015-2 #2	32D	SMH		1	1
(2)	2 EA PA CLOSER-STOP	4040XP S CUSH TBSRT	689	LCN		1	1
(2)	2 EA KICKPLATE	K10A 7" X 40" TAPE MTD	32D	SMH		1	1
(2)	2 EA WEATHERSTRIP	6216 1/8" X 3/8" X 84"	BLK	KNC		1	1
(1)	1 SET WEATHERSTRIP	W-17N 1/84" X 2/84"	628	KNC			
(2)	2 EA DOOR SWEEP	W-24S 42"	628	KNC		1	1
(1)	1 EA THRESHOLD	CT-10 84" X 10 X 1 1/2" FHSD TAP CON	627	KNC			

STANDARD 7'0 HINGE PITCH WITH THE ADDITIONAL 4TH HINGE MOUNTED 3" BELOW TOP HINGE

Heading 02 (HwSet)

1 SGL DOOR(S) D02 EXTERIOR FROM LOBBY 1.01
 3'6" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

Degree
 Hand Act InAct
 LHR 90

Totals	Each Assembly to have:						
(4)	4 EA HINGE	5BB1HW 5" X 4.5" NRP	630	IVE			
(1)	1 EA EXIT DEVICE	16-737P-8804J	32D	SAR			
(1)	1 EA PERMANENT MEDECO CYLINDER	BY NCDSB		UNK			
(1)	1 EA ELECTRIC STRIKE	6300	630	VON			
(1)	1 EA DOOR PULL	3015-2 #2	32D	SMH			
(1)	1 EA AUTO OPERATOR	BY HORTON AUTOMATICS	CL	HOR			
(1)	1 EA KICKPLATE	K10A 7" X 40" TAPE MTD	32D	SMH			
(1)	1 SET WEATHERSTRIP	W-17N 1/42" X 2/84"	628	KNC			
(1)	1 EA DOOR SWEEP	W-24S 42"	628	KNC			
(1)	1 EA THRESHOLD	CT-10 42" X 10 X 1 1/2" FHSD TAP CON	627	KNC			
(1)	1 EA CARD READER	BY ACCESS CONTROL SUPPLIER					
(1)	1 EA POWER SUPPLY	BY ACCESS CONTROL SUPPLIER					

STANDARD 7'0 HINGE PITCH WITH THE ADDITIONAL 4TH HINGE MOUNTED 3" BELOW TOP HINGE.
 AUTOMATIC OPERATOR SUPPLIED & INSTALLED BY HORTON AUTOMATICS

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Heading 02 (HwSet) Continued.....

**Hand Degree
Act InAct**

Heading 03 (HwSet)

1 SGL DOOR(S) D101-1 LOBBY 1.01 TO RECEPTION 101
 1 SGL DOOR(S) D101-2 CORRIDOR 1.02 TO RECEPTION 101
 3'2" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

**Hand Degree
Act InAct**
 RH 90
 RH 90

Totals Each Assembly to have:

(6)	3	EA	HINGE	5BB1 5" X 4"	652	IVE
(2)	1	EA	STOREROOM LOCKSET	28-73-7P-11G04 LL	26D	SAR
(2)	1	EA	ELECTRIC STRIKE	CX-ED1079D STANDARD	32D	CAM
(2)	1	EA	AUTO OPERATOR	BY HORTON AUTOMATICS	CL	HOR
(2)	1	EA	KICKPLATE	K10A 7" X 36.5" TAPE MTD	32D	SMH
(2)	1	EA	CARD READER	BY ACCESS CONTROL SUPPLIER		

AUTOMATIC OPERATOR SUPPLIED & INSTALLED BY HORTON AUTOMATICS

Heading 04 (HwSet)

1 SGL DOOR(S) D101A RECEPTION 101 TO PRINCIPAL'S OFFICE 101A
 3'2" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

**Hand Degree
Act InAct**
 RH 90

Totals Each Assembly to have:

(3)	3	EA	HINGE	5BB1 5" X 4"	652	IVE
(1)	1	EA	CLASSROOM LOCKSET	28-73-7P-11G37 LL	26D	SAR
(1)	1	EA	OVERHEAD STOP- HLDR	904F *FRICTION	630	GLY

Heading 05 (HwSet)

1 SGL DOOR(S) D102 RECEPTION 101 TO HEALTH 102
 3'2" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

**Hand Degree
Act InAct**
 LH 90

Totals Each Assembly to have:

(3)	3	EA	HINGE	5BB1 5" X 4"	652	IVE
(1)	1	EA	CLASSROOM LOCKSET	28-73-7P-11G37 LL	26D	SAR
(1)	1	EA	CC HD WALL STOP	S123	32D	SMH

Heading 06 (HwSet)

**Hand Degree
Act InAct**

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Heading 06 (HwSet) Continued.....

1 SGL DOOR(S) D103 CORRIDOR 1.02 TO COPY ROOM 103
 3'2" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

Hand **Degree**
 RH Act InAct
 90

Totals Each Assembly to have:

(3)	3	EA	HINGE	5BB1 5" X 4"	652	IVE
(1)	1	EA	STOREROOM LOCKSET	28-73-7P-11G04 LL	26D	SAR
(1)	1	EA	ELECTRIC STRIKE	CX-ED1079D STANDARD	32D	CAM
(1)	1	EA	PA CLOSER-STOP	1461 CUSH FC	689	LCN
(1)	1	EA	KICKPLATE	K10A 7" X 36.5" TAPE MTD	32D	SMH
(1)	1	EA	CARD READER	BY ACCESS CONTROL SUPPLIER		

Heading 07 (HwSet)

1 SGL DOOR(S) D103B RECEPTION 101 TO COPY ROOM 103
 3'2" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

Hand **Degree**
 RH Act InAct
 90

Totals Each Assembly to have:

(3)	3	EA	HINGE	5BB1 5" X 4"	652	IVE
(1)	1	EA	PASSAGE SET	28-11U15 LL	26D	SAR
(1)	1	EA	CC HD WALL STOP	S123	32D	SMH

End of Schedule

Project: ST THERESE CATHOLIC ELEM. SCHOOL	Control # : 2280	Print Date : 04/15/2024	Project # :
Supplier: GROUP 87 ARCHITECTURAL HARDWARE INC.	Revision # :	Rev Date :	Hdwe Sched Page : 3



Environmental Services (Niagara) Ltd.

Tel: 905-984-3455

Fax: 905-984-3055

Email ~ info@gbenvironmental.net



**2023 Asbestos Re-Assessment
St Therese Elementary School
530 Killaly St E.
Port Colborne, ON**

GBE Project #04-103-2023

October 1, 2023

Niagara Catholic District School Board
Attn: Anthony Ferrara
Administrator – Facilities Services Maintenance
427 Rice Rd.
Welland, ON
L3C 7C1

Dear Tony:

Between August 1 and September 30, 2023, GB Environmental Services completed our annual re-assessments to review the presence and condition of the known asbestos containing materials previously identified within school buildings owned by the Niagara Catholic District School Board (NCDSB).

Please note that no destructive means were taken, and this was only a re-assessment of visible and accessible materials.

There are no recommended remediation items for St Therese at this time.

On behalf of GB Environmental Services, we would like to thank you again for this opportunity. If you have any questions regarding this report, please call us at (905) 984-3455.

Sincerely,

Zachary Flett
Project Manager

2023 Asbestos Summary Listing

CONDITION:

Good: Materials observed to be in satisfactory condition, firmly bound or encapsulated and requiring no remedial action

Fair: Materials observed to be in a condition that does not currently require immediate remedial action. However, proactive measures to maintain or upgrade the surface finish of the material can be considered.

Poor: Materials that are damaged due to physical or chemical disturbance including: crumbling, blistering, nicks, gouges, abrasion, water damage or other damage. Remedial action is recommended.

CODING:

- A. A material which has been removed (A1) or encapsulated (A2);
- B. Material that has deteriorated in condition since the previous assessment (ie. good to fair or poor);
- C. Material which has been repaired or has improved in condition (ie. poor to fair or good);
- D. Material which has been deleted from the summary list due to errors in previous assessments;
- E. Material which has been added to the summary list due to errors in previous assessments;
- F. Additional information to distinguish between several types of the same material within the same room;
- G. Information contained within the summary list which was found to be incorrect;
- H. Material which was considered to be in poor condition and warrants the need for remedial action. A respective number (ie. 100-2016-1) is designated for the specific location of remediation.

PRIORITY:

Low: Material is damaged, but has a low potential for airborne fiber emission due to non-friability, inaccessibility, and / or other conditions;

Medium: Material is damaged, and has a moderate potential for airborne fiber emission due to friability, relative accessibility, and / or other conditions;

High: Material is damaged and is likely to result in airborne fiber emission if left in place. This includes friable debris, material likely to incur additional damage due to daily activities, and / or other conditions.



Plant ID #	Old Plant ID #	Asbestos Type	Comments	Friable	2023 Condition	Response
		Vermiculite	Block walls may contain vermiculite	Yes	Unkown	
		Mastic	May be present under floor tiles	Yes	Unkown	
1.02	29	Pipe fittings		Yes	Good	
1.04	45	Pipe fittings		Yes	Good	
1.08	29	Pipe fittings		Yes	Good	
1.08	50	Pipe fittings		Yes	Good	
1.09	48	Transit pipe		No	Good	
102	13	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
103	11	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
103A	12	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
104	9	Pipe fittings		Yes	Good	
105	10	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
105	10	Pipe fittings		Yes	Good	
109	5	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
110	3	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
111	1	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
112	2	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
113	4	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
114	6	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
115A	17	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
117A	20A	2'x4' Ceiling Tiles	Assumed asbestos containing	Yes	Good	
119	21	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
120	22	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
121	23	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
125	38	Transit pipe		No	Good	
126	40	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
127	39	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
127	39	Pipe fittings		Yes	Good	
128	37	Pipe fittings	In Crawl Space	Yes	Good	
128	37	Transit pipe		No	Good	
130	36	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
133	27	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
133A	28	12" x 12" Floor tiles	Assumed asbestos containing	No	Good	
133A		Pipe fittings	Mechanical Fan room above FS #133A	Yes	Good	
133B	26	Pipe fittings		Yes	Good	
133C		Pipe fittings	Mechanical Fan room above FS #133A	Yes	Good	



Environmental Services (Niagara) Ltd.

Tel: 905-984-3455

Fax: 905-984-3055

Email ~ info@gbenvironmental.net



Asbestos Audit

St Therese Elementary School

530 Killay St. E

Port Colborne, ON

Niagara Catholic District School Board



Date: January 26th, 2004
Reassessment October 1, 2023

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Section 1



Environmental Services (Niagara) Ltd.

Tel: 905-984-3455

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Our Compliments: 1-888-431-3986

Email ~ info@gbenvironmental.net



ASBESTOS AUDIT

August 30, 2014

GB Environmental Services (Niagara) Ltd. was retained by the Niagara Catholic District School Board to carry out an updated survey of the report completed by Q-Tech in 1990.

The purpose of this report is to update any remediation work completed, as well as to check on the condition of any identified asbestos materials. If any new materials were found, a sample was taken of this material to accept / deny their existence as ACM containing.

The areas surveyed inside of the school were within accessible areas of the structure. Several areas, such as areas above plaster ceilings, roofing felts on flat built up asphalt roofing, refractory materials inside operating boilers and binding agent (glue) used on the 1 x 1 ceiling tiles, were not tested at this time.

At St Therese Elementary School the following Asbestos Containing Materials (ACM) were identified.

1. 12" x 12" vinyl floor tiles (various colours)
2. Pipe elbows and joints
3. Transite Pipe
4. Transite Sheeting Blackboards

Summary & Recommendations

Since the last report was completed, the asbestos containing materials appear to be in relatively good shape.

The work of the investigators is considered sufficient to establish a general inventory of possible ACM on the site. All of the above work was completed at current industry standards however; GB Environmental staff cannot guarantee that ACM materials do not exist within the scope of this project.

Thank you for the opportunity to provide our service and please feel free to call our office if you have any further questions.

Completed by:

Jim Anderson



Niagara Catholic District School Board
 St Therese Elementary School
 530 Killay Rd.
 Port Colborne, ON

Ground Floor

Floor Plan Provided By
 NCDSB - nts



2004 Floor Plan

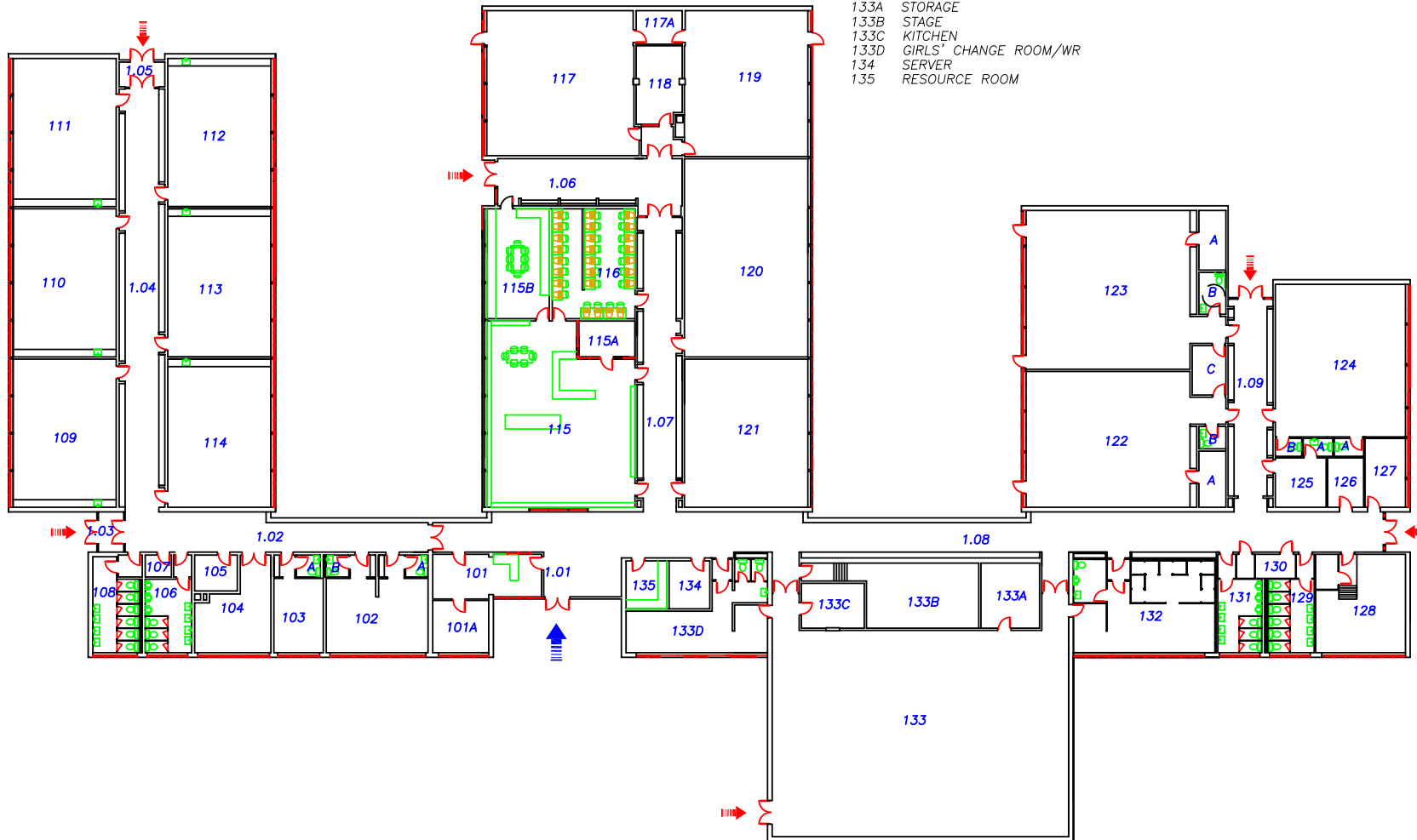
LEGEND:

1	CLASSROOM	13	STAFF ROOM AND WASHROOMS	24	GIRLS' CHANGE ROOM	35	GIRL'S WASHROOM
2	CLASSROOM	14	SECRETARY'S OFFICE	25	KITCHEN	36	CARETAKER'S STORAGE
3	CLASSROOM	15	PRINCIPAL'S OFFICE	26	STAGE	37	FURNACE ROOM
4	CLASSROOM	16	LIBRARY	27	GYMNASIUM	38	AUDIO VISUAL ROOM
5	CLASSROOM	17	LIBRARY WORK ROOM	28	STORAGE	39	STAFF WORK ROOM
6	CLASSROOM	18	RESOURCE-FRENCH ROOM	29A	KINDERGARTEN-JK/SK	40	SCHOOL SUPPLY STORAGE
7	GIRLS' WASHROOM	19	COMPUTER ROOM	29B	KINDERGARTEN-JK/SK/	41	KINDERGARTEN-SPECIAL EDUCATION
8	BOYS' WASHROOM	20A	STORAGE ROOM	30	STORAGE	42	WASHROOMS
9	FURNACE ROOM	20B	SEMINAR ROOM	31	OBSERVATION/MEETING ROOM	43	WASHROOM
10	CARETAKER'S ROOM	21	CLASSROOM	32	STORAGE	44	HANDICAP WASHROOM
11	HEALTH ROOM	22	CLASSROOM	33	BOYS' CHANGE ROOM/SHOWER	45	CORRIDOR
12	HEALTH ROOM WASHROOM	23	CLASSROOM	34	BOYS' WASHROOM	46	CORRIDOR
						47	CORRIDOR
						48	CORRIDOR
						49	CORRIDOR
						50	CORRIDOR

St Therese Elementary School
530 Killaly St E.
Port Colborne, ON
L3K 1P5

LEGEND:

- | | | | | |
|-------------------------|---------------------|-------------------------------|----------------------------|--------------------------|
| 101 ADMINISTRATION | 109 CLASSROOM | 118 SENSOY ROOM | 124A SPECIAL EDUCATION WR | 1.01 MAIN ENTRANCE/LOBBY |
| 101A PRINCIPAL'S OFFICE | 110 CLASSROOM | 119 CLASSROOM | 124B STORAGE | 1.02 CORRIDOR |
| 102 MEETING ROOM | 111 CLASSROOM | 120 CLASSROOM | 125 AUDIO VISUAL ROOM | 1.03 VESTIBULE |
| 102A STAFF WASHROOM | 112 CLASSROOM | 121 CLASSROOM | 125A WASHROOM | 1.04 CORRIDOR |
| 102B STAFF WASHROOM | 113 CLASSROOM | 122 KINDERGARTEN-JK | 126 SUPPLY STORAGE | 1.05 VESTIBULE |
| 103 READING RECOVERY | 114 CLASSROOM | 122A STORAGE | 127 FRENCH OFFICE | 1.06 CORRIDOR |
| 103A STAFF WASHROOM | 115 LIBRARY | 122B KINDERGARTEN WASHROOM | 128 FURNACE ROOM | 1.07 CORRIDOR |
| 104 FURNACE ROOM | 115A LIBRARY OFFICE | 122C OBSERVATION/MEETING ROOM | 129 GIRLS' WASHROOM | 1.08 CORRIDOR |
| 105 CARETAKER | 115B BOOK/DATA ROOM | 123 KINDERGARTEN-SK | 130 CARETAKER | 1.09 CORRIDOR |
| 106 BOYS' WASHROOM | 116 COMPUTERS | 123A STORAGE | 131 BOYS' WASHROOM | |
| 107 JANITOR | 117 CLASSROOM | 123B KINDERGARTEN WASHROOM | 132 BOYS' CHANGE ROOM/WR | |
| 108 GIRLS' WASHROOM | 117A STORAGE | 124 STAFF LOUNGE | 133 GYMNASIUM | |
| | | | 133A STORAGE | |
| | | | 133B STAGE | |
| | | | 133C KITCHEN | |
| | | | 133D GIRLS' CHANGE ROOM/WR | |
| | | | 134 SERVER | |
| | | | 135 RESOURCE ROOM | |



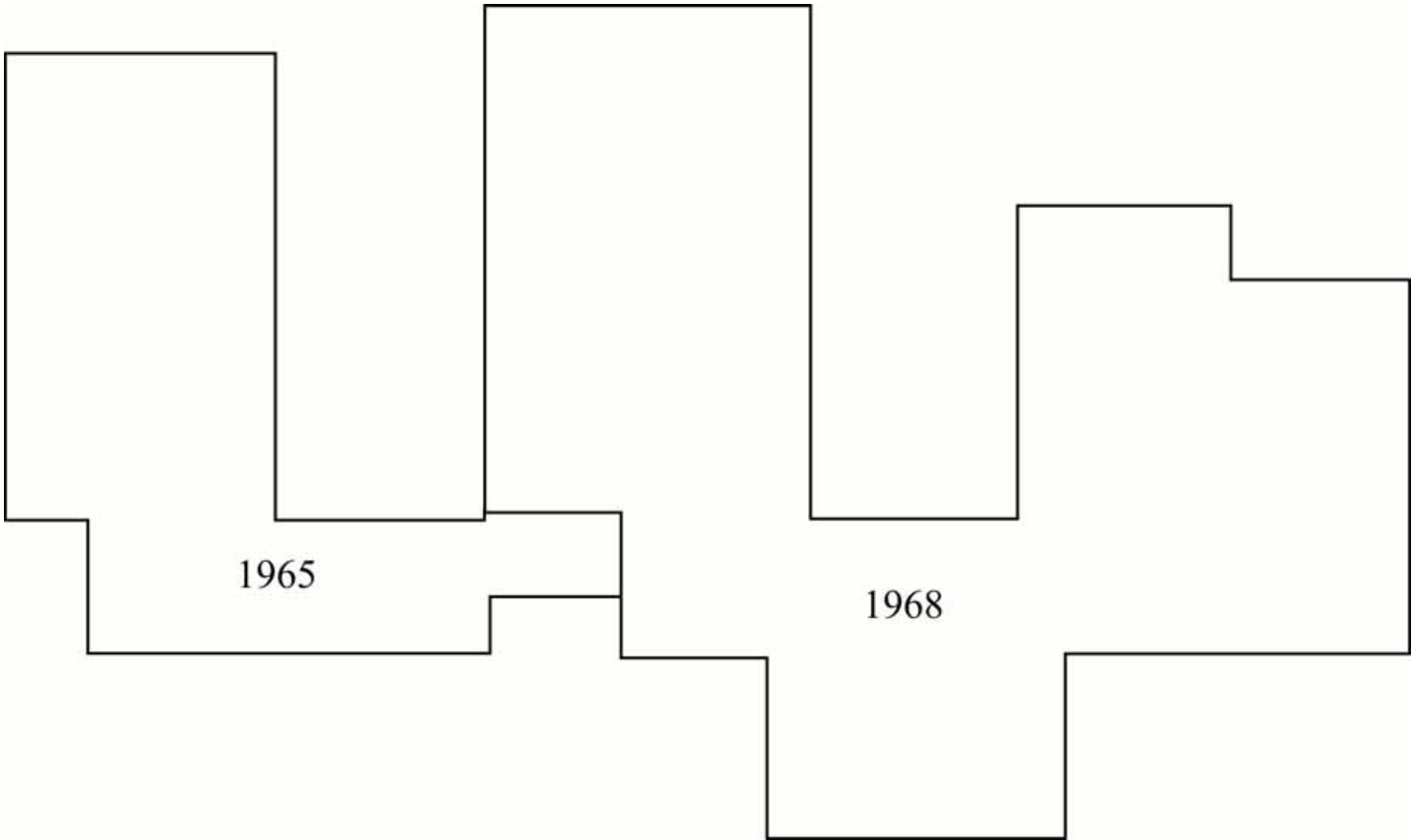
Niagara Catholic District School Board
 St Therese Elementary School
 530 Killay Rd.
 Port Colborne, ON

Ground Floor

Floor Plan Provided By
 NCDSB - nts



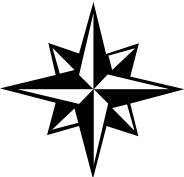
2016 Floor Plan



1965

1968

N

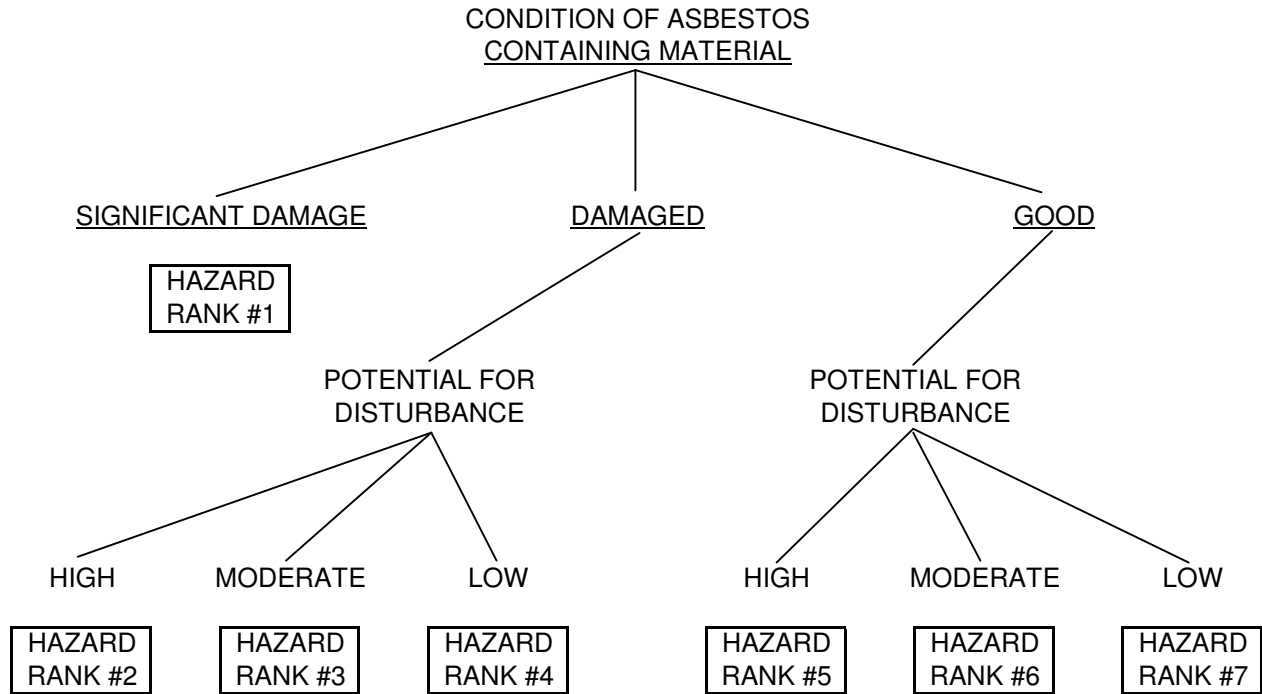


St Therese Elementary School
530 Killaly St E.
Port Colborne, ON
L3K 1P5



FIGURE 1

**CLASSIFICATION FOR ASBESTOS HAZARD POTENTIAL
(DECISION TREE DISPLAY)**



****NOTE**** Significant Damage is: 10% if damage is evenly distributed or 25% if damage is localized

**CLASSIFICATIONS FOR THE LEVEL
OF POTENTIAL DISTURBANCE**

POTENTIAL FOR DISTURBANCE	FREQUENCY OF POTENTIAL CONTACT	INFLUENCE OF VIBRATION	POTENTIAL FOR AIR EROSION
HIGH (i.e. potential for significant damage)	ANY VALUE FOR ONE OF THESE FACTORS		
MODERATE (i.e. potential for damage)	ANY MODERATE FOR ONE OR MORE OF THESE FACTORS		
LOW (i.e. little potential for damage)	ALL LOW VALUES		



HOMOGENEOUS MATERIALS LIST OF SUSPECTED ASBESTOS CONTAINING MATERIALS

Client: Niagara Catholic District School Board
 School Name: St Therese Elementary School
 School Address: 530 Killaly St. E., Port Colborne ON

Homogeneous Material Number	Description of Material	Type and Percent of Asbestos
1	9" x 9" vinyl Floor Tiles	
2	12" x 12" Vinyl Floor Tiles	
3	Vinyl Sheet Flooring	
4	Adhesive	
5	1' x 1' Ceiling Tiles	
6	2' x 2' Ceiling Tiles	
7	2' x 4' Ceiling Tiles	
8	Plaster	
8a	Textured Plaster	
9		
10	Fireproofing	
10a		
11	Gasket	
12	Pipe Insulation	
12a		
13	Pipe Elbows / T's	
14	Transite Pipe	
15	Insulating Paper	
16	Transite Sheeting	
17	Parging Cement	

Section 2

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board **Building Name:** St. Therese

Inspector: Wayne Jessome Chris Laskey

Homogeneous Area: 1968

Inspection Date: 1/27/2004

Functional Space Name: Mechanical / Fan Room

Functional Space Number: Above Stage Area (space #s 25, 26 & 28) (New I.D. # - Above 133 C & 133 A)

Comments: Not Shown on Updated Map

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Other	T	L	PIPE ELBOWS \ T's	13	35	EA	>5%	I	PD	F	YES	7				In room above FS #133C
Other	T	L	PIPE ELBOWS \ T's	13	45	EA	>5%	I	PD	F	YES	7				In room above FS #133A

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Classroom

Functional Space Number: 1 (New I.D. # 111)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D SD	F PD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	736	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	750	SF	>5%	I	PD	NF	A	5				Manage
Other	T	M	PIPE INSULATION	12	46	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

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PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Classroom

Functional Space Number: 2 (New I.D. # 112)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	736	SF				NO						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	750	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Classroom

Functional Space Number: 3 (New I.D. # 110)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	736	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	750	SF	>5%	I	PD	NF	A	5				Manage
Other	T	M	PIPE INSULATION	12	46	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Classroom

Functional Space Number: 4 (New I.D. # 113)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	736	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	750	SF	>5%	I	PD	NF	A	5				Manage
Other	T	M	PIPE INSULATION	12	46	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Classroom

Functional Space Number: 5 (New I.D. # 109)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D SD	F PD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	736	SF				NO						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	750	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged
A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Classroom

Functional Space Number: 6 (New I.D. # 114)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D SD	F PD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	736	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	750	SF	>5%	I	PD	NF	A	5				Manage
Other	T	M	PIPE INSULATION	12	46	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

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NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Girl's Washroom

Functional Space Number: 7 (New I.D. # 108)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	1'x1' CEILING TILES	5	210	SF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Boy's Washroom

Functional Space Number: 8 (New I.D. # 106)

Floor:

Comments:

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I D SD	NPD PD PSD	F N						
Ceiling	S	M	1'x1' CEILING TILES	5	210	SF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Boiler Room

Functional Space Number: 9 (New I.D. # 104)

Floor:

Comments:

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Other	T	M	PIPE INSULATION	12	209	LF					NO					
Other	T	M	PIPE ELBOWS \ T's	13	28	EACH	>5%	I	PD	F	YES	5	✓	1	Manage	

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Caretaker's Office

Functional Space Number: 10 (New I.D. # 105)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	80	SF	>5%	I	PD	NF	A	5				Manage
Other	T	M	PIPE INSULATION	12	40	LF					NO					
Other	T	M	PIPE ELBOWS \ T's	13	8	EACH	>5%	I	PD	F	YES	6				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Reading Recovery

Functional Space Number: 11 (New I.D. # 103)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	H	1'x1' CEILING TILES	5	218	SF				NO						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	218	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Staff Washroom

Functional Space Number: 12 (New I.D. # 103 A)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	H	1'x1' CEILING TILES	5	25	SF				NO						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	25	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Meeting Room

Functional Space Number: 13 (New I.D. # 102)

Floor:

Comments: A sample of the floor tile (tile size not indicated) was taken during the 1990 survey that showed the tile to contain 5-25% Amosite Asbestos. During the 2004 Audit it was unknown to the inspectors if the floor tile had been replaced

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	H	12x12 CEILING TILES		575	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	575	SF	>5%	I	PD	NF	A	5	✓			Manage

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged

A - Assumed
ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Secretary's Office

Functional Space Number: 14 (New I.D. # 101)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	108	SF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1965

Functional Space Name: Principal's Office

Functional Space Number: 15 (New I.D. # 101 A)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	144	SF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Library Office

Functional Space Number: 17 (New I.D. # 115 A)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D SD	F PD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	96	SF				NO						
Floor	S	M	12"x12" VINYL FLOOR TILES	2	96	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged

A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Book/ Data Room, Computers

Functional Space Number: 18 (New I.D. # 115 B & 116)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	12x12 CEILING TILES								NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	672	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1972

Functional Space Name: Classroom

Functional Space Number: 19 (New I.D. # 117)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	12 x 12 CEILING TILES								NO					
Floor	S	H	12"x12" VINYL FLOOR TILES													REMOVED

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged
A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1972

Functional Space Name: Storage Room

Functional Space Number: 20A (New I.D. # 117 A)

Floor:

Comments: Red Back Ceiling Tiles

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	96	SF					A					
Other	T	M	PIPE INSULATION	12	40	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1972

Functional Space Name: Sensory

Functional Space Number: 20B (New I.D. # 118)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	180	SF					NO					
Other	T	M	PIPE INSULATION	12	50	LF					NO					

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged
A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1972

Functional Space Name: Classroom

Functional Space Number: 21 (New I.D. # 119)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	1120	SF				NO						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	1120	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged

A - Assumed
ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Classroom

Functional Space Number: 22 (New I.D. # 120)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	1'x1' CEILING TILES	5	1036	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	1036	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Classroom

Functional Space Number: 23 (New I.D. # 121)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	H	1'x1' CEILING TILES	5	1020	SF				NO						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	1020	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged

A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Girl's Change Room

Functional Space Number: 24 (New I.D. # 133 D)

Floor:

Comments: No ACM evident

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged
A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Kitchen

Functional Space Number: 25 (New I.D. # 133 C)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Stage

Functional Space Number: 26 (New I.D. # 133 B)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Other	T	L	PIPE INSULATION	12	240	LF					NO					
Other	T	L	PIPE ELBOWS \ T's	13	78	EACH	>5%	I	PD	F	YES	6				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Gym

Functional Space Number: 27 (New I.D. # 133)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	H	2'x4' CEILING TILES	7	106	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	1906	SF	>5%	I	PD	NF	A	5				Manage
Other	T	M	PIPE ELBOWS \ T's	13	2	EACH	>5%	I	PD	F	YES	6				Manage
Other	T	M	PIPE INSULATION	12	28	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Storage

Functional Space Number: 28 (New I.D. # 133 A)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	210	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Corridor

Functional Space Number: 29 (New I.D. # 1.01, 1.02 & 1.08)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD SD PSD	F N						
Ceiling	S	M	2'x4' CEILING TILES	7	2257	SF					NO			3		
Other	T	M	PIPE ELBOWS \ T's	13	47	EACH	>5%	I	PD	F	YES	5			2 & 3	Manage
Other	T	M	PIPE INSULATION	12	625	LF					NO					

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
A - Assumed
SD - Severely Damaged

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Kindergarten-JK/SK

Functional Space Number: 29A (New I.D. # 122)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	1'x1' CEILING TILES	5	1128	SF					NO					
Floor	S	M	12"x12" VINYL FLOOR TILES	2												Removed August, 2021

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged
A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Kindergarten-JK/SK

Functional Space Number: 29B (New I.D. # 123)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	1'x1' CEILING TILES	5	1128	SF					NO					
Floor	S	M	12"x12" VINYL FLOOR TILES	2												Removed August, 2021

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Storage

Functional Space Number: 30 (New I.D. # 123 A)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	72	SF					NO					
Floor	S	M	12"x12" VINYL FLOOR TILES	2												Removed August, 2021

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged
NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

A - Assumed
ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Observation/Meeting Room

Functional Space Number: 31 (New I.D. # 122 C)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	120	SF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Storage

Functional Space Number: 32 (New I.D. # 122 A)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	72	SF					NO					
Floor	S	M	12"x12" VINYL FLOOR TILES	2												Removed August, 2021

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Boy's Change Room and Shower

Functional Space Number: 33 (New I.D. # 132)

Floor:

Comments: No ACM evident

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Boy's Washroom

Functional Space Number: 34 (New I.D. # 131)

Floor:

Comments: No ACM evident

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Girl's Washroom

Functional Space Number: 35 (New I.D. # 129)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	16	SF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Caretakers Storage

Functional Space Number: 36 (New I.D. # 130)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	45	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Furnace Room

Functional Space Number: 37 (New I.D. # 128)

Floor:

Comments: *Confined Space runs the length of 1.08 & 1.02. 12 fittings within sight of the entrance. Many more fittings expected.

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Other	T	M	TRANSITE PIPE	14	8	LF	>5%	I	PD	NF	YES	6				Manage
Other	T	M	PIPE INSULATION		150	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: Audio Visual Room

Functional Space Number: 38 (New I.D. # 125)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	H	2'x4' CEILING TILES	7	108	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	108	SF										REMOVED
Other	T	M	TRANSITE PIPE	14	6	LF	>5%	I	PD	NF	YES	6				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: French Office

Functional Space Number: 39 (New I.D. # 127)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	2'x4' CEILING TILES	7	144	SF					NO		1			
Floor	S	H	12"x12" VINYL FLOOR TILES	2	144	SF	>5%	I	PD	NF	A	5				Manage
Other	T	M	PIPE INSULATION	12	20	LF					NO					
Other	T	M	PIPE ELBOWS \ T's	13	8	EACH	>5%	I	PD	F	YES	6				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/26/2004

Homogeneous Area: 1968

Functional Space Name: School Supply Storage

Functional Space Number: 40 (New I.D. # 126)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	H	2'x4' CEILING TILES	7	99	SF				NO						
Floor	S	H	12"x12" VINYL FLOOR TILES	2	99	SF	>5%	I	PD	NF	A	5				Manage

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged

A - Assumed
ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Staff Lounge

Functional Space Number: 41 (New I.D. # 124)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	1152	SF					NO					
Other	T	M	PIPE INSULATION	12	74	LF					NO					
Other	T	M	PIPE ELBOWS \ T's	13												Removed August, 2021
Floor	S	H	12"X12" FLOOR TILES	2												Removed August, 2021

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Washroom

Functional Space Number: 42 (New I.D. # 124 A)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	42	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	40	SF										REMOVED

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Washroom

Functional Space Number: 43 (New I.D. # 122 B)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	30	SF					NO					
Floor	S	M	12"x12" VINYL FLOOR TILES	2												Removed August, 2021

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Washroom

Functional Space Number: 44 (New I.D. # 123 B)

Floor:

Comments: Similar to ceiling tiles found in Staff Work Room (space #39)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	30	SF					NO					
Floor	S	M	12"x12" VINYL FLOOR TILES	2												Removed August, 2021

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1965

Functional Space Name: Corridor

Functional Space Number: 45 (New I.D. # 1.04)

Floor:

Comments:

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	2'x4' CEILING TILES	7	800	SF					NO		2			
Other	T	M	PIPE INSULATION	12	475	LF					NO					
Other	T	M	PIPE ELBOWS \ T's	13	76	EACH	>5%	I	PD	F	YES	6				Manage

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Corridor

Functional Space Number: 48 (New I.D. # 1.09)

Floor:

Comments: Similar to ceiling tiles found in Corridor (space #29)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	368	SF					NO					
Ceiling	S	M	2'x4' CEILING TILES	7	384	SF					NO					
Floor	S	H	12"x12" VINYL FLOOR TILES	2	49	SF	>5%	I	PD	NF	A	5				Removed
Other	T	M	PIPE ELBOWS \ T's	13	7	EACH	>5%	I	PD	F	YES	7				Removed
Other	T	M	PIPE INSULATION	12	100	LF					NO					
Other	T	M	TRANSITE PIPE		45	LF		I	NPD	NF	YES	7				

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Corridor

Functional Space Number: 47 (New I.D. # 1.07)

Floor:

Comments: Similar to ceiling tiles found in Corridor (space #29)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	528	SF					NO					
Other	T	M	PIPE INSULATION	12	330	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

✓ - Refer to 1990 Survey

ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Corridor

Functional Space Number: 49 (New I.D. # 1.08)

Floor:

Comments: Similar to ceiling tiles found in Corridor (space #29)

Surface	Type S T M	ACC H M L	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
								I	NPD	F						
Ceiling	S	M	2'x4' CEILING TILES	7	63	SF					NO					
Other	T	M	PIPE INSULATION	12	20	LF					NO					

S - Surfacing

H - High

H.M. # - Homogeneous #

LF - Linear Feet

I - Intact

A - Assumed

ND - Not Detected

T - Thermal

M - Moderate

SF - Square Feet

D - Damaged

NS - Not Sampled

M - Miscellaneous

L - Low

NQ - Not Quantifiable

SD - Severely Damaged

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ACC - Accessibility

NPD - No Potential For Damage

NACC - Not Accessible

PD - Potential For Damage

PSD - Potential For Severe Damage

F - Friable

NF - Non-friable

Form 1

ASBESTOS BUILDING SURVEY FORM

Client: Niagara Catholic District School Board

Inspector: Wayne Jessome Chris Laskey

Building Name: St. Therese

Inspection Date: 1/27/2004

Homogeneous Area: 1968

Functional Space Name: Corridor

Functional Space Number: 50 (New I.D. # 1.08)

Floor:

Comments: Similar to ceiling tiles found in Corridor (space #29)

Surface	Type	ACC	Building Material	HM #	Total Amount	Units EACH LF SF NQ	Percent or Number Damaged	Condition			ACM Yes No A	Hazard Rank 0 to 7	Prev Sample Taken	New Sample Taken #	Picture Number	Response
	S T M	H M L						I	NPD D PD N	F SD PSD						
Ceiling	S	M	2'x4' CEILING TILES	7	63	SF					NO					
Other	T	M	PIPE ELBOWS \ T's	13	2	EACH	>5%	I	PD	F	YES	7				Manage
Other	T	M	PIPE INSULATION	12	20	LF					NO					

S - Surfacing
T - Thermal
M - Miscellaneous

H - High
M - Moderate
L - Low

H.M. # - Homogeneous #

LF - Linear Feet
SF - Square Feet
NQ - Not Quantifiable

I - Intact
D - Damaged
SD - Severely Damaged
A - Assumed

ND - Not Detected
NS - Not Sampled
 ✓ - Refer to 1990 Survey

ACC - Accessibility
NACC - Not Accessible

NPD - No Potential For Damage
PD - Potential For Damage
PSD - Potential For Severe Damage
F - Friable
NF - Non-friable



FORM 3

SAMPLING RECORD OF SUSPECTED ASBESTOS CONTAINING MATERIALS

Client: Niagara Catholic District School Board

Building Name: St Therese

Building Address: 530 Killaly St. E., Port Colborne

Note: Sample coordinates are taken starting from the North West corner of the Functional Space.

Homogeneous Material Number	Functional Space I.D. Number	Location of Sample				Sample I.D. No.	Date of Sampling M/D/Y
		Description	Coordinates				
			Ft. South	Ft. East			
7	39	Staff Work Room				1	1/28/2004
7	45	Corridor				2	1/28/2004
7	29	Corridor				3	1/28/2004



FORM 4
REQUEST FOR ANALYSIS / CHAIN OF CUSTODY
(BULK SAMPLE)

Date: _____	Job #: <u>12-348-2003</u>	TURNAROUND Same Day 24 HR 5 Day ANALYSIS PLM SEM
Client: <u>GB Environmental Services (Niagara) Ltd</u>	Job Name: <u>NCDSB-St Therese</u>	
Address: <u>12- 111 Fourth Ave., Suite 352</u>	Inspector: <u>Chris Laskey</u>	
<u>St Catharines, ON, L2S 3P5</u>	Requested By: <u>Jim Anderson</u>	

Field Sample Number	SAMPLE LOCATION			Lab Sample #	Material Description
	Description	Functional Space/Room	Homogenous Area / Date		
1	Staff Work Room	39	1968		2'x 4' Ceiling Tile
2	Corridor	45	1965		2'x 4' Ceiling Tile
3	Corridor	29	1965		2'x 4' Ceiling Tile

Sampled By: _____	Date: _____	Time: _____	Received By: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Laboratory: _____
Sample Storage: (Circle)	Immediate Disposal	3 Months	6 Months



Solutions for a Working World

Client: GB Environmental Services (Niagara) Ltd.

Contact: Mr. Jim Anderson

Client Address: 12-111 Fourth Av., Suite 352, St. Catharines, ON

Tuesday, May 4, 2004

Project Number: 08040545

Sampling Date: N/A

Client Reference: 12-348-2003/NCDSB-St.Therese

Total Number of Samples: 3

Analysis was performed in accordance with the method outline in the Regulation Respecting Asbestos on Construction Projects and in Building and Repair Operations - made under the Occupational Health and Safety Act Ontario Regulation 838/90 as amended by Ontario Regulation 510/92, Quebec Regulation 2.1, r.15, IRSST Method 224-1 and the EPA/600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. LEX Scientific Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

German Leal, B. Sc.
Laboratory Manager

Michael Hoffbauer, B.Sc.
Analyst

Client: GB Environmental Services (Niagara) Ltd.

Page 1 of 2

Project Number: 08040545

Fibrous Asbestos Content %

Other Materials Content %

LEX Sample #:	1	Chrysotile:	None Detected	Fibreglass:	None Detected
Sample #:	1	Amosite:	None Detected	Glasswool:	None Detected
Sample Colour:	Beige	Crocidolite:	None Detected	Rockwool:	60%
Analyst:	MH	Other Amphiboles:	None Detected	Cellulose:	5%
Sample Condition:	Sealed Bag			Other:	None Detected
Comments:	Staff Work Room; 2'X4' Ceiling Tile			Non-Fibrous:	35%

Other Amphiboles: ac = actinolite, a = anthophyllite, t = tremolite, u = unidentified

This test report relates only to the items tested

PLM method detection limit is 0.1%

It is recommended that all floor tile and vermiculite samples be analyzed using TEM

Analyst _____

This test report must not be used to claim product endorsement by NVLAP or any agency of the United States government. This report must not be reproduced except in full without the written consent of the laboratory.

Project Number: 08040545		Fibrous Asbestos Content %	Other Materials Content %
LEX Sample #:	2	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	2	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Beige/White/Red	Crocidolite: None Detected	Rockwool: 40%
Analyst:	MH	Other Amphiboles: None Detected	Cellulose: 20%
Sample Condition:	Sealed Bag		Other: None Detected
Comments:	Corridor; 2'X4' Ceiling Tile		Non-Fibrous: 40%
LEX Sample #:	3	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	3	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Beige	Crocidolite: None Detected	Rockwool: 30%
Analyst:	MH	Other Amphiboles: None Detected	Cellulose: 40%
Sample Condition:	Sealed Bag		Other: None Detected
Comments:	Corridor; 2'X4' Ceiling Tile		Non-Fibrous: 30%

Other Amphiboles: ac = actinolite, a = anthophyllite, t = tremolite, u = unidentified
 This test report relates only to the items tested
 PLM method detection limit is 0.1%
 It is recommended that all floor tile and vermiculite samples be analyzed using TEM

Analyst _____

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Picture 1

Damaged ACM elbow in Boiler room (space #9)



Picture 2

Damaged ACM elbow above drop ceiling in Corridor (space #29)



Picture 3

Damaged ACM elbow above drop ceiling in Corridor (space #29)