

# SPECIFICATIONS

Project Name

**Barrier Free Upgrades  
Our Lady of Fatima Catholic School,  
  
for the  
Huron Superior Catholic  
District School Board**

14 Strathcona Street  
Chapleau, Ontario

## **Volume 2 – Specification Divisions 00-26**

*Issued for Tender & Construction*

Project Number

**21026b**

Date

**15 March 2023**

**IDEA**

Integrated Design  
Engineering + Architecture  
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Discipline	Company Name, Address and Name of Professional	Professional Seal
Architect Prime Consultant	IDEA Inc. 421 Bay Street Suite 507 Sault Ste. Marie, Ontario Canada P6A 1X3  Architect: Curtis Berkenbosch	
Mechanical Engineer	IDEA Inc. 421 Bay Street Suite 507 Sault Ste. Marie, Ontario Canada P6A 1X3  Engineer: Justin Campbell	
Electrical Engineer	IDEA Inc. 421 Bay Street Suite 507 Sault Ste. Marie, Ontario Canada P6A 1X3  Engineer: Jeanette Biemann	

Structural Engineer	A2S Consulting Engineers 289 Cedar St. Suite 201 Sudbury, Ontario Canada P3B 1M8  Engineer: Aaron Dent	
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For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

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PART 1 - GENERAL

1.1 The Agreement

- .1 The Canadian Construction Document #2 2008 edition.

1.2 Specification

- .1 The Specification in its entirety, refer to Section 00 01 11, Table of Contents. This includes the General Conditions and Supplementary Conditions to the CCDC#2 (2008) Document.

1.3 Drawings

- .1 The following is the list of Drawings for the Project, dated  
**15 March, 2023**

Title	
a 0.00	Title Sheet
<b>Architectural</b>	
al 2.00	Level 2 Life Safety Plan
ar 2.00	Level 2 & Level 1 Existing Floor Plan Removals
ar 3.00	Level 2 & Level 1 Reflected Ceiling Plan Removals
a 0.10	Assemblies & Information
a 1.00	Partial Site Plan
a 2.00	Level 2 & Level 1 Floor Plan New
a 2.30	Roof Plan New
a 3.00	Level 2 Reflected Ceiling Plan & Details New
a 4.00	Exterior Elevations & Sections
a 6.00	Window Sections Removals & New
a 8.00	Enlarged Floor Plans
a 10.00	Stair & Handrail Details
a 12.00	Door and Screen Types, Details & Specialties
<b>Structural</b>	
s 1.00	Structural Work
<b>Mechanical</b>	
m 0.00	Mechanical Notes, Legends, Details & Schedules
m 1.10	Mechanical Level 1 – HVAC & Plumbing Plans
<b>Electrical</b>	
e 0.0	Electrical Spec., Legend, Details & Equipment Schedule
e 2.00	Level 2 - Power and Auxiliary Systems – Demo/New
e 3.00	Level 2 – Lighting and Ceiling Devices Plan – Removals/New

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1.4 Addenda

- .1 All addenda issued to Tenderers prior to tender close.

**END OF SECTION**



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PART 1 - GENERAL

1.1 INVITATION

- .1 Tender Call
- .1 **Tender Call Submissions:**, Offers signed under seal, executed, and dated will be received on or before:
- 11:00:00 (11:00:00 a.m.) local time on April 5<sup>th</sup>, 2023**
- .2 Address and deliver Tenders to the following location:
- Barrier Free Upgrades  
– Our Lady of Fatima Catholic School  
For HSCDSB  
c/o IDEA Inc.  
421 Bay Street  
Suite 507  
Sault Ste. Marie, Ontario  
P6A 1X3***
- .3 Offers submitted after above time will be returned to bidder unopened.
- .4 Include name and address of Tenderer and project name and number on the face of the Tender Envelope
- .5 Tender Opening:
- .1 **There will be a Virtual Public Opening at 11:15:00 (11:15am) on Microsoft Teams**
- .6 Where reference to Owner is made in the Contract Documents it shall mean the:  
**Huron-Superior Catholic District School Board**
- .7 Where reference to Consultant, Architect or Engineer is made in the Contract Documents it shall mean:  
**IDEA Inc.**

1.2 INTENT

- .1 Intent of this Tender call is to obtain an offer to perform work to complete project known as:
- Barrier Free Upgrades  
– Our Lady of Fatima Catholic School  
for the HSCDSB  
14 Strathcona Street,  
Chapleau, Ontario**
- .2 Consultants Project Number: **21026b**
- .3 The Consultants Project Number and Project Name must appear as a

header to **ALL** correspondence related to the project.

- .4 Tenders are called for a Stipulated Price contract, in accordance with Contract Documents
- .5 Perform Work within time stated in Section 01 11 00 - Summary of Work and as further described and detailed in the Contract Documents
- .6 Accept the "Letter of Intent" as the contract award date and initiate work within five (5) days of receipt of said letter.
- .7 Work under this contract shall commence immediately upon award of the contract and shall continue to completion without interruption

### 1.3 VIRTUAL SITE WALKTHROUGH

- .1 A Library of available recorded video, photographs, drawings etc. constituting a walk-through of the project Site & Building(s) shall be provided by Addendum. Hereinafter, referred to as the *Site Information*, and forming part of the Contract Documents, in lieu of a mandatory site meeting
- .2 The purpose of this *Site Information* is to familiarize general Contractors, Sub-Contractors and Sub-Trades with existing Site and Building conditions. The Project Site shall be accepted by the Contractor in its condition at time of Tender.
- .3 The Contractor, by acknowledging the Addendum in Tender Forms, will be held to have carefully examined all *Site Information* contents; including video, audio, photo, drawings etc.. documenting conditions affecting the site and building, the work to be done there on, the location of all services which may have to be protected, removed or relocated. The Contractor shall accept responsibility for review and distribution of same information to all Sub-Contractors and Sub-Trades.
- .4 Questions that may arise from this review shall be submitted & responded to according to Query/Addenda protocols below. Additional *Site Information* may be requested, and responses shall be circulated via addenda.
- .5 The Contractor shall accept sole responsibility for any error or neglect on their part in this respect. Submission of Tender shall be deemed confirmation that tenderer has reviewed all *Site Information* and is thoroughly conversant with existing conditions as can be observed at the date of the tender close.
- .6 No claims for extra payment will be considered for work, expense or difficulties encountered due to conditions of the site or building which were visible or reasonably inferable from the Site Information.
- .7 The contractor may request an on-site walkthrough with Steve Brown at [steve.brown@hscdsb.on.ca](mailto:steve.brown@hscdsb.on.ca), this is not mandatory.

### 1.4 CONTRACT/BID DOCUMENTS

- .1 Agreement Form
  - .1 Contract Documents: Defined in **CCDC2 – 2020** Edition,

- Definitions
- .2 And as amended with Supplementary General Conditions as described in Section 00 73 00.
- .2 Tender Documents: Contract Documents, including Drawings and Specifications, supplemented with Instructions to Tenders (Addenda), Tender Form, and Tender Supplementary Forms identified herein:
  - .1 Tender, Offer, or Bidding: Act of submitting an offer under seal
  - .2 Tender Price: Monetary sum identified in Tender Form as an offer to perform work
- .3 Availability
  - .1 Tender Documents may be obtained through the Sault Ste. Marie Construction Association
  - .2 Tender Documents are available in electronic format (PDF)
  - .3 Tender documents are not available via hardcopy.
  - .4 Tender Documents will be made available to SSM and Sudbury Construction Associations and Plans Rooms. They in turn will share with any and all other plans rooms.
  - .5 Tender Documents are made available only for purpose of obtaining offers for this project. Their use does not confer license or grant for other purposes.
- .4 Examination
  - .1 Upon receipt of Tender Documents verify that documents are complete.
  - .2 Immediately notify Consultant upon finding discrepancies or omissions in Tender Documents.
  - .3 Contractor shall be held to have carefully examined all drawings, specification, schedules, and site for all trade-work and to be familiar with all conditions, requirements and limitations pertaining to the work.
  - .4 Examine the specifications and drawings thoroughly. Report to Architect all ambiguities, discrepancies, omissions, errors, departures from Building By-Laws, or from good practice, discovered during examination as early in the tender period as possible to allow clarification by addenda to be issued to all bidders. No claims for extra payment will be considered for work, expense or difficulties which are reasonably inferable from an examination of the documents prior to the closing of tenders.
  - .5 The drawings and specifications complement each other and neither is to be considered alone. Hence, any item omitted in one, but mentioned or implied in the other, must be provided.
  - .6 Bidders finding discrepancies or omissions in the drawings or specifications shall at once notify the Consultant who shall send written instructions to all bidders. Bidders may, during the tender period, be advised by addenda of any additions, alterations or deletions to the specifications and drawings. All such changes shall be covered by the tender and become part of the contract documents.
  - .7 If any person submitting a bid on this project is in doubt as to the true meaning and intent of any part of the specifications or other documents, he must request an interpretation from

the Consultant. If such interpretation is not requested, the bids will be presumed to be based on the interpretation or directions that may be subsequently given by the Consultant after award of the Contract, in accordance with the provisions of the Contract.

## 1.5 TENDER QUERIES

- .1 All Queries, Requests for Clarification and Requests for Approved Alternates by bidders must be provided in writing; verbal queries will not be accepted.
  - .1 All inquiries shall be made via Email.
  - .2 Include Project Number and Name in subject line of the email.

Questions pertaining to the content of the contract documents, scope of work, etc. shall be directed to the design Consultants. Queries may be directed to the consultant responsible for the discipline as indicated in the Specification Table of Contents or Drawing Sheet title-block, but a copy must be sent to the Prime Consultant Project Manager and the Owner's Representative

- .3 Prime Consultant: IDEA Inc.  
Project Manager: Evan Lavallee  
Email: elavallee@integrateddesign.ca
- .2 All Queries, Requests for Clarification and Requests for Approved Alternates by bidders must be received at the office of the consultant, not less than **three (3) days** before time set for receipt of Tenders.
- .3 Verbal answers by the Owner or Consultant will not be binding unless confirmed by written addenda.
- .4 Reply will be in form of written addendum, a copy of which will be forwarded to registered bidders and construction associations no later than **two (2) days** before receipt of Tenders.

## 1.6 PROPOSED SUBSTITUTIONS

- .1 Refer to specification Section 01 34 00 – Substitution Alternate Procedures
- .2 Where Tender Documents stipulate a particular product, substitutions will be considered by Consultant up to **three (3) days** before receipt of Tenders. Request made after this deadline, will not be considered, or responded to.
- .3 If the request is reviewed and accepted the Consultant will issue notification via Addendum
- .4 Submission shall include sufficient information to enable Consultant to compare proposed alternate to specified product and determine acceptability of such products.
  - .1 Provide reference to product specified and proposed alternate/substitution.
  - .2 Provide specific reference to drawings number and/or specification section and article number.
  - .3 Provide comparison chart(s) of features of specified material

- vs. proposed material.
- .4 Incomplete or illegible proposals may be summarily rejected. No notification will be provided.
- .5 In making the application for the proposed substitution, the **Tenderer** shall be held to have included for, **any and all** changes required in work to accommodate such substitutions.
- .1 It shall be the sole responsibility of the Tenderer to ensure that the substituted material or equipment is fully compatible with available space, location, method of installation, work of other trades, and the like.
- .2 A later claim by Tenderer/Contractor for an addition to contract price or contract time because of changes in work necessitated by use of substitutions shall not be considered.
- .3 The Consultant does not undertake any obligation to revise any portion of the design to accommodate a proposed substitution.
- .6 The Consultant reserves the right to accept or reject, without explanation, any or all proposals.

#### 1.7 SUB-DIVISION OF WORK

- .1 These Specifications have been divided into Divisions and Sections of work according to the accepted standards of Construction Specifications Canada (CSC) for the Construction Specifications Institute (CSI)
- .2 The Contractor shall have sole responsibility for determination of subdivision of the material, labour and services necessary to complete the project to the specified standards of the proposed Contract Documents
- .3 The Contractor shall be responsible for distributing all sections and divisions of the work to the Sub-trades bidding the work during tender phase and to the Sub-trades which are retained to perform the work during construction
- .4 The Contractor will ensure that all of his/her Sub-trades are completely familiar with all the requirements of the Contract Documents which may affect their price.
- .5 Main Divisions as listed in the table of contents are intended to be bid directly to the General Contractor. If major divisions are carried under another major division's contract, mark-up will only be allowed once.

#### 1.8 QUALIFICATIONS

- .1 Firms or persons submitting tenders shall be actually engaged in the line of work required by the proposed Contract Documents and shall be able to refer to work of similar nature completed by them.
- .2 It is the bidder's responsibility to closely review the qualifications to confirm they meet and can readily demonstrate their ability to meet or exceed the listed qualifications. Any questions or concerns with the qualifications or evaluation process must be identified to the Consultant ten (10) days prior to the tender close.

.3 The Owner has identified a number of Contractor Qualifications that will be used in the Tender Evaluation process to determine the best value for the Owner's project. Bidders are not required to submit qualifications with their tender submissions but may be requested to submit this information as supplemental to inform the evaluation process, refer to article 1.13 Evaluation. The Owner reserves the right to request additional information as required to evaluate the Contractor against these qualifications. The Owner identified qualifications are as noted below:

- .1 **General Intention:** The HSCDSB wishes to obtain a Contractor whom is capable and willing to work continuously throughout the summer months of 2023, including day, evening and weekend shifts as is necessary to complete the work specified within these contract documents, and according to the schedule requirements of section 1.11 Contract Time below.
- .2 **Previous Construction Experience:** The Contractor must be able to demonstrate successful completion of at least three (3) previous construction projects of similar size, budget and/or construction type. At least one of the projects must be a renovation or addition to an occupied facility. If requested, submit to the Consultant the relevant project experience for review. For each project include: Project title, year completed, project budget, brief project description, Client and Consultants Contact information
- .3 **Superintendents Experience:** The Contractor must be able to demonstrate that the proposed Superintendent has at least ten (10) years' experience in the Construction Industry, has relevant experience as the full time Superintendent on similar Construction projects, specifically managing renovation construction projects. If requested, submit to the Consultant the Superintendents Resume inclusive of education, past project experience and at least two (2) references that can speak to the Superintendents previous project experience and character.
- .4 **Contractor References:** The Contractor must be able to provide References (a mix of Client and Consultant) that can validate the Contractors previous project experience and provide an opinion on the Contractors quality of work, ability to coordinate with trades, ability to maintain a project schedule, fairness in addressing changes and unforeseen conditions that arise during construction. If requested, submit to the Consultant at least three (3) References complete with Reference Name, Company, Title, Phone Number, Email Address and Project Title for which they are providing a reference on.
- .5 **Safety:** The Owner would like to ensure that the successful Contractor understands and their responsibility for health and safety for this project, has comprehensive internal health and safety policies, and is engaging an experienced individual to

act as the Health and Safety Coordinator. If requested, submit to the Consultant the Contractors Health and Safety Manual and the Resume for the proposed Health and Safety Coordinator.

- .6 **Commitment to Schedule:** The HSCDSB requires the renovations milestones to be completed prior to Key dates described below. The successful Contractor must demonstrate that they are committed to scheduling and performing the work to achieve this deliverable. The successful Contractor will be required to submit a workplan and construction schedule that demonstrates the above and that will form part of the contract. **The Contractor will submit this information within 5 days after having been requested to do so, at the discretion of the Owner.**

.4 Subcontractors

- .1 Owner reserves right to reject a proposed subcontractor for reasonable cause.
- .2 Refer to CCDC2 - 2020, Article GC 3.7 of General Conditions.
- .3 The Owner may request any proposed subcontractor to provide satisfactory evidence that they have the ability, experience, capital and plant to enable them to execute their portion of the work of the contract
- .4 Nothing contained in the Contract Documents shall be interpreted as the Owner having any contractual obligations or relationships to a subcontractor.

1.9 BID SUBMISSION

.1 Bid Ineligibility

- .1 Tenders that are unsigned, improperly completed, improperly signed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may, at discretion of Owner, be declared informal
- .2 Tenders with Tender Forms and enclosures which are improperly prepared, may, at discretion of Owner, be declared informal
- .3 Tenders that fail to include security deposit, bonding or insurance requirements, may, at discretion of Owner, be declared informal
- .4 Oral, telegraphed, faxed, or telephoned proposals, or modifications to, submitted proposals will not be accepted or considered.

.2 Submissions:

- .1 Tenderers shall be solely responsible for delivery of their Tenders in manner and time prescribed.
- .2 Submit one copy of executed offer on Tender Forms provided, signed and with corporate seal together with required security in a sealed opaque envelope, clearly identified with Tenderers name, project name and Owner's name on outside
- .3 Fill in all spaces, monetary items shall be filled in with words

- and figures
- .4 Identification: State on Tender Form, Contractor's name, address and contact information in spaces provided
- .5 Addenda: Acknowledge all Addenda issued at the time of tender by inserting the number of the final Addenda received in the space allocated on the Tender Form
- .6 Offer Amount: State on Tender Form, Tenderer's offer, in the form of a Stipulated Sum, for the labour, material and services required to complete the Work described in the Contract Documents.
- .7 Contract Time. State on the Tender Form, time (in weeks) required to complete the Work as described.
- .3 Tender Signing
  - .1 Tender form shall be signed under seal by Tenderer
  - .2 Sole Proprietorship: Signature of sole proprietor in presence of witness who will also sign. Insert words "Sole Proprietor" under signature. Affix seal
  - .3 Partnership: Signature of all partners in presence of witness who will also sign. Insert word 'Partner' under each signature. Affix seal to each signature
  - .4 Limited Company: Signature of duly authorized signing officer(s) in normal signatures. Insert officer's capacity in which signing officer acts, under each signature. Affix corporate seal. If Tender is signed by officials other than President and Secretary of company, or President-Secretary-Treasurer of company, copy of by-law resolution of Board of Directors authorizing them to do so must also be submitted with Tender in Tender envelope.
  - .5 Joint Venture: Each party of joint venture must execute Tender under respective seals in manner appropriate to such party as described above, similar to requirements of Partnership
- .4 An abstract of submitted Tenders may, at the discretion of the Owner,, be made available to Tenderers following Tender opening.

#### 1.10 CONTRACT TIME

- .1 The contractor/bidder shall carefully evaluate and assign the amount of time required to complete all Work as described in their tender. This shall be expressed as the number of Calendar Weeks from contract award to Substantial and Total Performance, (as defined by the Construction Act, current edition and as supplemented in specification section 01 77 00 Closeout Procedures). This shall be expressed in a number of Calendar Weeks on the tender form.
  - .1 This number will be used by the Consultant to assign the "Contact Completion Date" in the preparation of the formal construction Contracts. This will be calculated from the date of the issuance of the "Letter of Intent" plus the number of calendar weeks stated in the tender..
- .2 This declared completion time may be used by the Owner for the purpose of evaluating "best overall value". For the purpose of tender evaluations "best overall value" can be measured by contemplating the lowest overall price against the best overall declared completion time.



- .3 The site will be available for construction on a full-time basis starting **July 3<sup>rd</sup>, 2023**, at which time Contractors will have full (24hr) access until the 2 weeks prior to the commencement of the 2023 school year. The Owner requires "Substantial Performance" completion date for this project no later than August 25<sup>th</sup>, 2023, with "Total Performance" to follow by September 2<sup>nd</sup>, 2023 (School opening). The Owner **requires** the school to be operational and without any impact from construction activities beyond August 26<sup>th</sup> 2023.
- .4 Work that is non-consequential to the operation of the school may be completed after **August 25<sup>th</sup>, 2023**. Construction hours will be after 3:30pm, weekends and holidays. The Contractor shall remove all construction materials, equipment and debris from the areas of work and the areas shall be thoroughly cleaned, so as not to create a hazard or disrupt next school-day activities. The Contractor may provide their own secure onsite storage, to be coordinated with the Owner. The Contractor may be allowed to perform some limited work during regular school hours, if it is deemed to be essential, but this will be on a case-by-case basis and will have to be coordinated and approved in advance by the Owner. **The Contractor cannot rely on this availability.**
- .5 The Owner's own forces will require access to this area two weeks prior to school start. Life Safety measures shall be coordinated for Owner access throughout the Summer.
- .6 The Tender/Contractor shall declare the amount of time required to complete **all Base Bid Work** as described in their tender, excluding all listed Separate Price Options. This shall be the date of "Total Performance" of the *Work* as indicated in the Contract Documents.  
.1 This shall be expressed in a number of Calendar Weeks.
- .7 This declared completion time may be used by the Owner for the purpose of evaluating "best overall value". For the purpose of tender evaluations "best overall value" can be measured by contemplating the lowest overall price against the best overall declared completion time.
- .8 The declared completion time expressed in "number of weeks" as provided with the tender will be used by the Owner to define the Contract Completion Date in the formal Construction Contract (CCDC 2). This date shall be the number of calendar weeks from the date of the "Letter of Intent".
- .9 The successful Contractor shall work throughout the 2023 Summer months, **including day and evening shifts, including weekends in order to have the renovations completed by August 25<sup>th</sup>, 2023**. All new services are to be re-connected to existing to ensure a fully operational school and Occupancy Permit.

#### 1.11 SUB-TRADE LIST

- .1 Refer to specification 00 41 13a1 - Tender Form Appendix A List of Subcontractors
- .2 Provide the name of the Individual/Subcontractor or Major Supplier, included in the tender for each item indicated in each list.

- .1 Complete all fields in the list
- .2 Provide a single name in each field.
- .3 Changes to listed sub-trades/suppliers shall not be made without the express written consent of the Owner.
- .4 Listed sub-contractors shall be actually engaged in the line of work required listed and shall be able to refer to work of similar nature completed by them.
  - .1 References to projects of similar size and nature must be provided upon request.
- .5 Incomplete forms, improperly completed forms or incorrect forms may result in the contractors bid being deemed invalid.

**1.12 TENDER SUBMISSION****REQUIREMENTS**

- .1 The **Tender Submission** should contain all of the following information.
  - .1 Tender Form
  - .2 Tender Form Appendix A - List of Sub-trades
  - .3 Tender Form Appendix B – Separate Alternate and Identified Prices
  - .4 Performance Bond, agreement to provide. Refer to Section 00 60 00 Bonding Requirements and provide an Agreement to provide the prescribed Security.
  - .5 Material Labour Payment Bond, agreement to provide. Refer to Section 00 60 00 Bonding Requirements and provide an Agreement to provide the prescribed Security.

**1.13 TENDER SUBMISSION****REQUIREMENTS****ADJUSTMENTS**

- .1 Adjustments to the Primary and/or Supplemental Submissions requirements stated above shall be accepted via e-mail, prior to Tender Close in the following format only:
  - .1 State **only the amounts to be added or deducted** from the Tender Submissions required above, to achieve the adjusted final amounts, which shall be calculated at Tender Opening.
  - .2 Provide added / deducted amounts in a clear manner, corresponding to Tender Form and Tender Form Appendix documents, as needed.
  - .3 Revisions to Tender Form Appendix A - List of Sub-trades shall also be accepted. State the Trade to be replaced and new entry only.
- .2 Address to, [elavallee@integrateddesign.ca](mailto:elavallee@integrateddesign.ca) including a read receipt. Arrival time is determined by IDEA Inc. E-mail timestamp. Arrival prior to Tender Close is at the Bidders' risk. This risk extends to include any interruption of Internet Service or Power affecting delivery of these documents.

**1.14 OFFER ACCEPTANCE  
/ REJECTION**

- .1 Duration of Offer Acceptance/Rejection
  - .1 Tenders shall remain open to acceptance and irrevocable for a period of **thirty (30) days** after the Tender closing date. If withdrawn the respective Tenderer shall forfeit his Security Deposit. Telephone calls, email, messaging, facsimiles or telegrams will not be considered.

- .2 Acceptance of Offer
  - .1 Owner reserves right to accept or reject any or all offers
  - .2 The Owner reserves the power and right to reject tenders received from parties who cannot show a reasonable acquaintance of the class of work herein specified and shown on the drawings.
    - .1 Evidence of such competency must be furnished by tenderer when requested.
  - .3 In the reception of tenders for the work, no obligation is incurred to accept the lowest or any proposal provided by a tenderer. The Owner reserves the right to refuse any or all tenders for any sub-division of the work or to decline to proceed with all the work if the Board so determines.
  - .4 After acceptance by Owner, the Consultant will issue a letter (Letter of Intent) to the successful Tenderer, relating the Owners acceptance of the Tender. This Letter of Intent will form the start date of the Contract. Formal contracts will be prepared for signatures and circulated to required parties by the Consultant.
  - .5 The Owner reserves the right to request any other additional information he/she may require to evaluate the submission. Failure to provide the information requested in a timely manner may result in the tender being disqualified.
  - .6 Upon acceptance, the successful Tenderer shall provide, within ten (10) business days the following documentation
    - .1 Bonding Certificates
    - .2 Workplace Safety and Insurance Board Certificate
    - .3 Certificate of Insurance (refer to CCDC 2 and the Supplementary Conditions)
    - .4 Signed Copy of Owners Contractors Procedure Manual (refer to 01 14 00 Work Restrictions)
    - .5 Copies of applicable permits
    - .6 Other(s) as may be reasonable requested
    - .7 Contractor's Health and Safety Policy Manual

#### 1.15 AWARD OF THE CONTRACT

- .1 Other factors affecting the Contract Award
  - .1 A Bidder's past performance, organization, proposed subcontractors, equipment, and ability to perform and complete this Contract in the manner and within the time specified, together with the amount of the Tender, will be vital elements considered in the award of the Contract.
- .2 Acceptance of Tender
  - .1 No Bidder shall consider them under Contract after the opening and reading of Tenders until the AGREEMENT is signed and compliance therewith has been made.

#### 1.16 DELETION OF WORK UNDER THE CONTRACT

- .1 The Owner reserves the right to delete any or all work from the contract.

#### 1.17 BUILDING CODES

- .1 All work is to be carried out in accordance with the latest edition of the

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 00 21 13  
INSTRUCTIONS TO BIDDERS  
Page 12 of 12

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AND SAFETY ACT

Local, Provincial and Federal Construction and Building Codes, By-laws,  
including the Occupation Health and Safety Act

.2 Comply with requirements of Workplace Hazardous Materials  
Information System (WHIMS) regarding use, handling, storage, and disposal  
of hazardous materials; and regarding labeling and provision of material and  
safety data sheets acceptable to Labour Canada and Health and Welfare  
Canada.

.1 Deliver copies of WHIMS data sheets to Owner on delivery of  
materials and provide copies in Maintenance Manuals.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 00 41 13

TENDER FORM

Page 1 of 3

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ARCHITECTS PROJECT NUMBER

PROJECT NAME

**Barrier Free Upgrades  
Our Lady of Fatima Catholic School  
for the HSCDSB  
14 Strathcona Street  
Chapleau, Ontario**

SUBMITTED BY

Contractor Name:

---

---

Address:

---

---

---

Telephone Number:

---

Primary E-Mail:

---

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 00 41 13

TENDER FORM

Page 2 of 3

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OFFER

The undersigned, represents that he/she has had sufficient opportunity to examine and has carefully examined the Contract Documents, including all addenda, the General Conditions of the Contract, as amended by the Supplementary General Conditions, having become thoroughly familiar with local conditions affecting the performance and costs of the work, and having inspected the site, hereby offer to furnish all the materials, plant and labour necessary for the proper completion of the all Work, including any, applicable taxes, agree to enter into a contract with the Owner, for the sum of:

Contract Documents including Addenda(s) No. \_\_\_\_ through \_\_\_\_ inclusive as prepared by the Consultant for the Stipulated sum of:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (\$\_\_\_\_\_.)

Harmonized Sales Tax:

The Harmonized Sales Tax shall be thirteen percent (13%) in addition to the base tender amount. The amount of the Harmonized Sales Tax is:

\_\_\_\_\_  
\_\_\_\_\_ (\$\_\_\_\_\_.)

Completion Date

I/We have reviewed the scope of this project with all of our sub-trades and suppliers and agree to complete the *Work* of the Contract in accordance with the requirements of the Contract Documents on or before the dates indicated below:

Substantial Performance \_\_\_\_\_ Number of Weeks from tender award

Total Performance \_\_\_\_\_ Number of Weeks from tender award

Signatures:

Authorized Signatures:

\_\_\_\_\_  
Name and title of person signing

Signature: \_\_\_\_\_

Witness: \_\_\_\_\_

Date: \_\_\_\_\_

Contractor's Corporate Seal:

END OF TENDER FORM

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 00 41 13-A  
TENDER FORM – APPENDIX A  
LIST OF SUB-TRADES  
Page 1 of 1

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Architect's Project Number

**21026b**

Project Name:

**Barrier Free Upgrades  
Our Lady of Fatima Catholic School  
for the HSCDSB  
14 Strathcona Street,  
Chapleau, Ontario**

Submitted By: (Contractors Name)

---

Subcontractors and Major Suppliers

The UNDERSIGNED lists herein the individual Subcontractor and Major Supplier for the trades listed below and who he/she proposes to employ on the project, and upon whose sub-trade or supply quotation he/she based the Stipulated Sum quoted herein, and agrees that no change shall be made in the list, as regards such Subcontractor or Supplier actually employed on the work without the express written consent of the Owner.

Listed sub-contractors shall be actually engaged in the line of work required listed and shall be able to refer to work of similar nature completed by them.

Provide only **ONE** name per section

This Appendix forms part of the contract and failure on part of the contractor to **COMPLETE EACH SECTION FULLY** may result in the contractors bid being **REJECTED**.

<b>Trade/Division/Product</b>	<b>Subcontractor/Supplier</b>
<b>Structural Steel, Stair, Guardrails</b>	
<b>Roof Patchwork</b>	
<b>Gypsum Board Assemblies</b>	
<b>Flooring</b>	
<b>Door, Door Hardware</b>	
<b>Mechanical HVAC</b>	
<b>Plumbing</b>	
<b>Electrical</b>	

**End of Section**



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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 00 41 13b

TENDER FORM

APPENDIX B

SEPARATE ALTERNATE  
AND IDENTIFIED PRICES

Page 1 of 1

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Architect's Project Number

**21026b**

Project Name:

**Barrier Free**

**Our Lady of Fatima Catholic School**

For the Huron Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Submitted By: (Contractor's Name)

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1.0 General

Provide Separate, Alternate and Identified Prices as per Section 01 23 10, Separate Alternate and Identified Prices. All prices provided shall be exclusive of Harmonized Sales Tax.

1.1 Separate Price Number 1

Should the scope of the work be modified as per Article 1.6.1 of Section 01 23 10

**Separate Price Number 1**

**Roof Access Ladder + Roof Access Hatch**

The Contractor shall provide a separate price in the form of an amount to be added to the Stipulated Sum Tendered amount should the Owner decide to revise to include this scope in the contract.

Add:

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\_\_\_\_\_ (\$\_\_\_\_\_.\_\_\_\_)  
from the Tender Price (H.S.T. not included)

We confirm that the above quoted tender price includes all SPO1 allowance(s) as defined in Section 01 21 00 Allowances

**END OF SECTION**

**PART 1 - GENERAL****1.1 BONDS**

.1 The successful Tenderer shall be required to furnish the following Bonds/Surety or provide adequate Security as defined below for the execution of the Contract:

.1 **Performance Bond 50%.** A Performance Bond, not less than **Fifty percent (50%)** of the Tender amount

.1 The form of the Bond shall be the CCDC form 221 (2002) Performance Bond, and as may be amended by the Supplementary General Conditions

.2 Refer to CCDC Document 2 (Revised 2008) Article GC 11.2

.3 The issuing company of the Bond must be approved by the Canadian Construction Association

.4 Performance Bond shall remain in place for a period of 12 months from the date of final certificate of payment.

.2 **Labour Material Payment Bond.** A Labour Material Payment Bond, not less than **Fifty percent (50%)** of the Tender amount.

.1 The form of the Bond shall be the CCDC form 222 (2002) Labour Material Payment Bond, and as may be amended by the Supplementary General Conditions

.2 Refer to CCDC Document 2 (Revised 2008) Article GC 11.2

.3 The issuing company of the Bond must be approved by the Canadian Construction Association

.3 **Other acceptable forms of Security**

.1 In lieu of the Bonding described above, the Owner will also consider a certified cheque or an Irrevocable Letter of Credit in an amount no less than **One Hundred percent (100%)** of the Tender amount.

.1 Certified Cheques used shall be drawn on a member of the Canadian Payments Association or a local cooperative credit society that is a member of a central cooperative credit society having membership in the Canadian Payments Association, payable to the order of the Owner, for no less than the amount stated above.

.2 Irrevocable Letters of credit will be considered from reputable Canadian Banks and Credit Unions at the discretion of the Owner, be provided on the financial institutions letter head, be unconditional, allow for multiple partial draws, and automatically renew until the Owner notifies the financial institution in writing that the project obligations have been completed (12 months from the date of final certificate of payment).

.2 Include the cost to provide the Bonds in the Tender Amount

.3 Formalized, sealed, certified copies of the type of security being issued are to be provided within **seven (7)** days of Tender Award, after receiving notification of acceptance of their quotation from the Owner, (Letter of Intent).

.4 Other acceptable forms of security

## 1.2 CONSENT OF SURETY OR AGREEMENT TO BOND

.1 Tenders shall be accompanied by an agreement to provide the required security in the form of either:

.1 Consent of Surety or Agreement to Bond, signed and sealed by Tender's surety, stating that surety is willing to supply Performance and Labour and Materials Payment Bond as described above.

.2 or a signed letter from the financial institution confirming the Contractors capacity and the financial institutions intent to provide the contractor with the required security as described above along with a copy of the standard security form for review.

.2 Include the cost to provide this Consent or Surety in the Tender Amount.

## 1.3 BID BOND

.1 Tenders shall be accompanied by a Security Deposit / Bid Bond in the amount of:

.1 Every tender shall be accompanied by a tender deposit (Security Deposit) in the form of a bid bond in the amount equal to **\$50,000**.

.2 Endorse Bid Bond in the name of the Owner, as obligee, signed and sealed by the principal Contractor and Surety.

.3 Use the latest edition CCDC approved Bond Forms.

.4 Security deposit will be returned after delivery to Owner of Required Performance, and Labour Material Payment Bond(s) by the accepted tenderer.

.5 If no contract is awarded, all security deposits will be returned.

.2 All costs to provide the Security described above shall be included in the Tender Amount.

.3 Formalized, sealed, certified copies of the type of security being issued are to be provided within seven (7) days of Tender Award, after receiving notification of acceptance of their quotation from the Owner, (Letter of Intent) or forfeit the amount of the Bid Bond enclosed with the tender.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

**PART 1 - GENERAL****1.1 INTRODUCTION**

- .1 The following Supplementary Conditions modify, change, delete from or add to the Articles of Agreement, the Definitions, and the General Conditions of the Stipulated Price Contract, **Standard Construction Document CCDC2, 2020**
- .2 Where any Article, Definition, General Condition, paragraph, subparagraph or clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Definition, General Condition paragraph, subparagraph or clause shall remain in effect
- .3 Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused
- .4 All references within these documents, to the "Ontario Construction Lien Act" or "Construction Lien Act" or the like, refers to the most recent legislation that was passed on July 1, 2018, in which, the Ontario Construction Lien Act has become the Construction Act (the "Act").

**1.2 MODIFICATIONS TO ARTICLES****.1 ARTICLE A-3 – CONTRACT DOCUMENTS**

- .1 Amend paragraph A-3.1 to add the following after the words, "The General Conditions of the Stipulated Price Contract"
  - "- These Supplementary General Conditions
  - The Specific Conditions, if any
  - Drawings
  - Specifications"

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

- .1 Delete paragraph 5.3 – Interest, in its entirety.

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

- .1 Amend paragraph 6.1, by deleting the words, "or by facsimile" in the second sentence, the words, "facsimile, or other form of" in the fourth sentence, and the words, "facsimile number" wherever they appear:

**1.3 MODIFICATIONS TO DEFINITIONS****.1 DEFINITIONS**

- .1 Add a new Definition, "Act" as follows:  
**"Act**  
*Act means the Construction Act (Ontario), as amended."*

- .2 Add a new Definition, "*As-Built Drawings*" as follows:

**"As-Built Drawings"**

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

- .3 Add a new Definition, "*Confidential Information*" as follows:

**"Confidential Information"**

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

- .1 is or becomes generally available to the public without fault or breach on the part of the Contractor, including without limitation breach of any duty of confidentiality owed by the Contractor to the Owner or to any third party, but only after that information becomes generally available to the public
- .2 the Contractor can demonstrate to have been rightfully obtained by the Contractor from a third party who had the right to transfer or disclose it to the Contractor free of any obligation of confidence;
- .3 the Contractor can demonstrate to have been rightfully known to or in the possession of the Contractor at the time of disclosure, free of any obligation of confidence; or
- .4 is independently developed by the Contractor without use of any *Confidential Information*."

- .4 Add a new Definition, "*OSHA*" as follows:

**"OSHA"**

*OSHA* means the *Ontario Health and Safety Act* (Ontario), as amended."

- .5 Add a new Definition, "*Personal Information*" as follows:

**"Personal Information"**

*Personal Information* means personal information as that term is defined in subsection 2(1) of the *Freedom of Information and Protection of Privacy Act*, and includes personal health information as that term is defined in subsection 2(1) of the *Personal Health Information Protection Act* which definitions extend to individual's name, address, age, date of birth, sex, and religion, and any and all personal health information of an individual, whether recorded in printed form, on film, by electronic means, or otherwise."

- .6 Add a new Definition, "*Proper Invoice*" as follows:

**"Proper Invoice"**

*Proper Invoice* means an invoice that complies with the requirements of the Construction Act and also a includes the following"

- .1 a breakdown of the invoice amount by trade or division as required by the specifications,
- .2 an updated schedule in a form and level of detail acceptable to the owner showing the percentage complete on each task,
- .3 a Workplace Safety and Insurance Board clearances showing current coverage.
- .4 a Statutory Declaration in the form of CCDC 9A 2018 (for every invoice after the first invoice)"

- .7 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
- Record drawings and manuals to provide instructions to the operation and maintenance of

- the *Work*.”
- .8 Add a new Definition, “*WSIB*” as follows:  
“***WSIB***  
*WSIB* means the *Workplace Safety and Insurance Board*.”
- .9 Add a new Definition, “*Daily Work Records*” as follows:  
“***Daily Work Records***  
*Daily Work Records* mean daily records detailing the number and categories of workers and hours worked or on standby, types and quantities of *Construction Equipment*, and descriptions and quantities of *Product* utilized.”

#### 1.4 MODIFICATIONS TO GENERAL CONDITIONS

.1 **GC 1.1 CONTRACT DOCUMENTS**

- .1 Add to the end of subparagraph 1.1.2.2  
“.....Except where the *Consultant* shall be indemnified as a third party beneficiary as provided in subparagraphs 9.2.7.4, 9.2.8.4, 9.5.2.4 and 9.5.3.4 and in 12.1.1.”
- .2 Delete 1.1.6 in its entirety and substitute the following:  
“1.1.6 The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Owner* or the *Consultant* to settle disputes among the *Subcontractors* and *Suppliers* with respect to such divisions. The *Drawings* are, in part, diagrammatic and are intended to convey the scope of the *Work* and indicate general and appropriate locations, arrangements and sizes of fixtures, equipment and outlets. The *Contractor* shall obtain more accurate information about the locations, arrangements and sizes from study and coordination of the *Drawings*, including *Shop Drawings* and shall become familiar with conditions and spaces affecting those matters before proceedings with the *Work*. Where site conditions require reasonable minor changes in indicated locations and arrangements, the *Contractor* shall make such changes at no additional cost to the *Owner*. Similarly, where known conditions or existing conditions interfere with new installation and require relocation, the *Contractor* shall include such relocation in the *Work*. The *Contractor* shall arrange and install fixtures and equipment in such a way as to conserve as much headroom and space as possible. The schedules are those portions of the *Contract Documents*, wherever located and whenever issued, which compile information of similar content and may consist of drawings, tables and/or lists.
- .3 Delete 1.1.7.1 in its entirety and substitute the following:  
“1.1.7.1 If there is a conflict within the Contract Documents, the order of priority of documents, from highest to lowest, shall be.
- any amendment to the Agreement between the Owner and the Contractor.
  - The Agreement between the Owner and the Contractor, as amended by these Supplementary General Conditions
  - The Definitions
  - Specific Conditions
  - Supplementary Conditions
  - The General Conditions
  - Division 1 of the Specifications,
  - Technical Specifications,
  - Material and finishing Schedules.
- .4 Add new subparagraphs 1.1.7.5 thru 1.1.7.10 as follows:  
“1.1.7.5 In case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the *Contract Documents*.  
1.1.7.6 Finishes in the room finish schedules shall govern over those shown on the *Drawings*  
1.1.7.7 Schedules of Division 01 – General Requirements of the *Specifications* shall form part

of and be read in conjunction with the technical specification section as listed in the table of contents of the *Specifications*

1.1.7.8 Architectural drawings shall have precedence over structural, plumbing, mechanical, electrical and landscape drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts and architectural elements of construction, it being understood that the integrity and installation of the systems designed by the *Consultant* or its sub-*Consultants* are to remain with each of the applicable drawing disciplines.

1.1.7.9 Should reference standards contained in the *Specifications* conflict with the *Specifications*, the *Specifications* shall govern. Should reference standards and *Specifications* conflict with each other or if certain requirements of the *Specifications* conflict with other requirements of the *Specifications*, the more stringent requirements shall govern.

.5 Delete 1.1.8 in its entirety and substitute the following:

"1.1.8 The *Contractor* shall be responsible to provide all printed copies of the *Contract Documents* that may be necessary and or required to perform the *Work*, submit for permit and provide as builds. At the completion of the work the *Contractor* be held responsible to collect and destroy all copies not turned over to the Owner, used for permits or contracts."

## .2 **GC 2.2 ROLE OF THE CONSULTANT**

.1 Add new paragraph 2.2.0 as follows:

"2.2.0 The *Consultant* is not signatory to, is not party to, "*the Agreement*" between the *Owner* and the *Contractor*, and as such is not bound by any conditions or requirements as stated therein. The *Owner* and the *Contractor* shall indemnify and save harmless the *Consultant* from any claims arising from a disagreement between the two signatory parties."

.2 Amend paragraph 2.2.3 by deleting the second sentence thereof.

.3 Delete paragraph 2.2.4. in its entirety

.4 Add the word "schedules" after the word "techniques" in paragraph 2.2.6.

.5 Add to the end of the second sentence of paragraph 2.2.6. ".....or to adhere to the construction schedule"

.6 Add at the end of paragraph 2.2.9. "The *Owner* and the *Contractor* shall waive any claims against the *Consultant* arising out of the making of such interpretations and findings in accordance with paragraphs 2.2.7., 2.2.8. and 2.2.9".

.7 Add new sentence to end of paragraph 2.2.11 "The *Consultant's* obligation to make findings on a large claim or large number of claims is subject to the terms and conditions of the *Owner/Consultant* agreement."

.8 Amend paragraph 2.2.13 by the addition of the following to the end of that paragraph:

".....If, in the opinion of the *Contractor*, the *Supplemental Instruction* involves an adjustment in the *Contract Price* or in the *Contract Time*, it shall, within ten (10) *Working Days* of receipt of a *Supplemental Instruction*, provide the *Consultant* with a notice in writing to that effect. Failure to provide written notification within the time stipulated in this paragraph 2.2.13 shall be deemed an acceptance of the *Supplemental Instruction* by the *Contractor*, without any adjustment in the *Contract Price* or *Contract Time*."

.9 Delete the comma after the word "submittals" and add the words "which are provided" before the words "in accordance" in paragraph 2.2.14.

.10 Delete paragraph 2.2.16 in its entirety and replace it with the following:

"2.2.16 The *Contractor* shall complete the deficiency review of the *Work*, and provide detailed results of the review prior to requesting a Substantial Performance Inspection of the *Consultant*. Then the *Consultant* and *Contractor* will jointly conduct reviews of the *Work* to determine *Substantial Performance of the Work* and completion of the *Work* as provided in GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK and GC 5.7 – FINAL PAYMENT. The *Consultant* will issue a Certificate of Substantial Performance if, in their sole opinion, meets the requirements."



.3 **GC 2.3 REVIEW AND INSPECTION OF THE WORK**

- .1 Delete paragraph 2.3.3 in its entirety and replace it with the following:  
"2.3.3 The *Contractor* shall furnish copies to the *Consultant* and *Owner* of all certificates and inspection reports relating to the *Work*."
- .2 Insert the word "review" after the word "inspections" in the first line of paragraph 2.3.4.
- .3 Add a new paragraph 2.3.8 as follows:  
"2.3.8 The *Consultant* will conduct periodic reviews of the *Work* in progress, to determine general conformance with the requirements of the *Contract Documents*. Such reviews, or lack thereof, shall not give rise to any claims by the *Contractor* in connection with construction means, methods, techniques, sequences and procedures, nor in connection with construction safety at the *Place of Work*, responsibility for which belongs exclusively to the *Contractor*."

.4 **GC 2.4 DEFECTIVE WORK**

- .1 Amend paragraph 2.4.1. by adding the following at the end, "at no additional cost to the *Owner*."
- .2 Add new subparagraphs 2.4.1.1 and 2.4.1.2:  
"2.4.1.1 The *Contractor* shall rectify, in a manner acceptable to the *Owner* and the *Consultant*, all defective work and deficiencies throughout the *Work*, whether or not they are specifically identified by the *Consultant*."  
"2.4.1.2 The *Contractor* shall prioritize the correction of any defective work which, in the sole discretion of the *Owner*, adversely affects the day to day operation of the *Owner*."

.5 **GC 3.1 CONTROL OF THE WORK**

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

.6 **GC 3.3 TEMPORARY WORK**

- .1 In paragraph 3.3.2, in the second line after the words "where required by law", insert "or the *Consultant*".

.7 **GC 3.4 DOCUMENT REVIEW**

- .1 Delete paragraph 3.4.1 in its entirety and substitute new paragraph 3.4.1:  
"3.4.1 The Contractor shall review the Contract Documents and shall report promptly to the Consultant any error, inconsistency or omission the Contractor may discover. Such review by the Contractor shall comply with the standard of care described in paragraph 3.14.1 of the Contract. Except for its obligation to make such review and report the result, the Contractor does not assume any responsibility to the Owner or to the Consultant for the accuracy of the Contract Documents. The Contractor shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the Contract Documents, which the Contractor could not reasonably have discovered. If the Contractor does discover any error, inconsistency or omission in the Contract Documents, the Contractor shall not proceed with the work affected until the Contractor has received corrected or missing information from the Consultant."
- .2 Add new paragraph 3.4.2 as follows:  
"3.4.2 If the Contractor finds discrepancies in and/or omissions from the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, the *Contractor* shall

immediately notify the *Consultant*, who will provide written instructions or explanations.  
Neither the *Owner* nor the *Consultant* will be responsible for oral instructions"

.8 **GC 3.6 SUPERVISION**

- .1 Amend paragraph 3.6.1 by adding the following after the words, "competent representative", "who shall be a Competent Person, as that term is defined in the Occupational Health and Safety Act," and by deleting the last sentence, and replacing it with the following, "The *Contractor* shall not be entitled to change the Competent Person without the prior written authorization of the *Owner*, which shall not be unreasonably withheld."

.9 **GC 3.7 SUBCONTRACTORS AND SUPPLIERS**

- .1 Add to paragraph 3.7.1.1 add to the end of the second line  
".....including any warranties and service agreements which extend beyond the term of the *Contract*."
- .2 Add to subparagraph 3.7.1.2 after the words "the *Contract Documents*" insert the words "including any required surety bonding"

.10 **GC 3.8 LABOUR AND PRODUCTS**

- .1 Delete paragraph 3.8.2 and substitute with the following:  
"3.8.2 *Products* provided shall be new and shall conform to all current applicable specifications of the Canadian Standards Association, Canadian Standards Board or General Standards Board, ASTM, National Building Code, provincial and municipal building codes, fire safety standards, and all governmental authorities and regulatory agencies having jurisdiction at the *Place of the Work*, unless otherwise specified. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*. Specified *Products* shall not be substituted with another product without the express written consent of the *Consultant*."
- .2 Amend paragraph 3.8.3 by adding the words, "..., agents, *Subcontractors* and *Suppliers*..." after the word "employees" in the first line
- .3 Add new paragraph 3.8.4 and 3.8.5 as follows:  
"3.8.4 The Contractor is responsible for the safe on-site storage of *Products* and their protection (including *Products* supplied by the Owner and other contractors to be installed under the *Contract*) in such ways as to avoid dangerous conditions or contamination to the *Products* or other persons or property and in locations at the *Place of the Work* to the satisfaction of the *Owner* and the *Consultant*. The *Owner* shall provide all relevant information on the *Products* to be supplied by the *Owner*."
- 3.8.5 The cost for overtime required beyond the normal *Working Day* to complete individual construction operations of a continuous nature, such as pouring or finishing of concrete or similar work, or *Work* that the *Contractor* elects to perform at overtime rates without the *Owner* requesting it, shall not be chargeable to the *Owner*"

.11 **GC 3.10 SHOP DRAWINGS**

- .1 Add the words "AND OTHER SUBMITTALS" to the Title after SHOP DRAWINGS
- .2 Add "and Submittals" after the words "Shop Drawings" in paragraphs 3.10.1, 3.10.2, 3.10.4, 3.10.7, 3.10.8, 3.10.8.2, 3.10.9, 3.10.10, 3.10.11, and 3.10.12.
- .3 Delete 3.10.3 in its entirety and substitute new paragraph 3.10.3  
"3.10.3 The Contractor shall prepare a schedule of the dates for provision, review and return of Shop Drawings and Submittals and submit it to the *Consultant* for review."
- .4 Delete paragraph 3.10.9 in its entirety and substitute the following:  
"3.10.9 At the time of providing *Shop Drawings*, the *Contractor* shall advise the *Consultant* in writing of any deviations in *Shop Drawings* from the requirements of the *Contract Documents*. The *Consultant* shall indicate the acceptance of such deviation expressly in writing. Where manufacturers' literature is submitted in lieu of scaled drawings, it shall be clearly marked in ink, to indicate the specific items for which review is requested"
- .5 Delete the words "so as to cause no delay in the performance of the *Work*" in paragraph 3.10.12

- .6     Add new paragraphs 3.10.13 as follows  
      "3.10.13   Reviewed *Shop Drawings* shall not authorize a change in the *Contract Price* and/or the *Contract Time*"
- .12    **GC 3.13   CLEAN-UP**  
      .1     Add new paragraphs 3.13.4 as follows:  
          "3.13.4   In the event that the *Contractor* fails to remove waste and debris as provided in this GC 3.13, then the *Owner* or the *Consultant* may give the *Contractor* twenty-four (24) hours written notice to meet its obligations respecting clean up. Should the *Contractor* fail to meet its obligations pursuant to this GC 3.13 within the twenty-four (24) hour period next following delivery of the notice, the *Owner* may remove such waste and debris and deduct from payments otherwise due to the *Contractor*, the *Owner's* costs for such clean up, including a reasonable mark-up for administration costs."
- .13    **GC 3.14   PERFORMANCE BY CONTRACTOR**  
      .1     Add new General Condition 3.14 PERFORMANCE BY CONTRACTOR and new paragraphs 3.14.1 and 3.14.2 as follows  
          "3.14.1   In performing its services and obligations under the *Contract*, the *Contractor* shall exercise a standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The *Contractor* acknowledges and agrees that throughout the *Contract*, the *Contractor's* obligations, duties and responsibilities shall be interpreted in accordance with this standard. The *Contractor* shall exercise the same standard of due care and diligence in respect of any Products, personnel, or procedures which it may recommend to the *Owner*."  
          "3.14.2   The *Contractor* further represents, covenants and warrants to the *Owner* that:  
              .1     The personnel it assigns to the Project are appropriately experienced.  
              .2     It has a sufficient staff of qualified and competent personnel to replace its designated supervisor and project manager, subject to the *Owner's* approval, in the event of death, incapacity, removal or resignation."
- .14    **GC 4.1   CASH ALLOWANCES (if applicable to Contract)**  
      .1     Delete the second sentence in paragraph 4.1.1  
      .2     Delete paragraph 4.1.4 in its entirety and substitute new paragraph 4.1.4:  
          "4.1.4   Where the actual cost of the *Work* under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the *Consultant's* direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the *Contract Price* for overhead and profit. Only where the actual cost of the *Work* under all cash allowances exceeds the total amount of all cash allowances shall the *Contractor* be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the *Contract Documents*."  
      .3     Delete paragraph 4.1.5 in its entirety and substitute new paragraph 4.1.5:  
          "4.1.5   The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price* by *Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount."  
      .4     Delete paragraph 4.1.7 in its entirety and substitute new paragraph 4.1.7.  
          "4.1.7.   The *Contractor* shall prepare a schedule that shows when the *Owner* must authorize ordering of items called for under cash allowances to avoid delaying the progress of the work."  
      .5     Add new paragraph 4.1.8:  
          "4.1.8   The *Owner* reserves the right to call, or to have the *Contractor* call, for competitive bids for portions of the *Work*, to be paid for from cash allowances."

**.15 GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT**

- .1 Amend paragraph 5.2.1. by adding the following at the end thereof:  
"The *Contractor* shall submit their application, or *Proper Invoice*, to both the *Consultant* and the *Owner*."
- .2 Revise article 5.2.3 to read as follows:  
"5.2.3 The amount claimed shall be for the value, proportionate to the amount of the *Contract*, of *Work* performed, and *Products* delivered to the *Place of the Work* as of the last day of the payment period. No amount claimed shall include products delivered and incorporated into the work, unless the products are free and clear of all security interests, liens and other claims of third parties."
- .3 Amend paragraph 5.2.4 by deleting the words "calendar days" and preplacing them with "Working Days".
- .4 Amend paragraph 5.2.7 by adding the following at the end thereof:  
"Any *Products* delivered to the *Place of Work* but not yet incorporated into the *Work* shall remain at the risk of the *Contractor* notwithstanding that title has passed to the *Owner* pursuant to GC 13.1 OWNERSHIP OF MATERIALS."
- .5 Add new article 5.2.8 as follows:  
"5.2.8 The second and all subsequent applications for payment shall be accompanied by a *WSIB* clearance certificate and Statutory Declaration, executed by the *Contractor*, in the form acceptable to the *Owner*."
- .6 Add new article 5.2.9 as follows:  
"5.2.9 As "as-built" item shall be identified on the cost breakdown with all corresponding fair and reasonable value for the purpose of ensuring that the as-built information drawings are given due diligence."

**.16 GC 5.3 PROGRESS PAYMENT**

- .1 Delete sub-paragraph 5.3.1.1 in its entirety.
- .2 Revise sub-paragraph 5.3.1.2 as follows: After the words "issue to the *Owner*" delete "and copy to the *Contractor*". After the words "after the receipt of the" add "complete":
- .3 Delete paragraph 5.3.1.3 in its entirety and substitute new paragraph 5.3.1.3. as follows:  
"5.3.1.3 the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement - PAYMENT on or before 28 calendar days after receipt of a *Proper Invoice*."

**.17 GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 Delete paragraph 5.4.3 in its entirety and substitute new paragraph 5.4.3.  
"5.4.3 Immediately prior to the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor*, in consultation with the *Consultant*, shall establish reasonable dates for finishing the *Work* and correcting deficiencies."
- .2 Add new paragraph 5.5.4, 5.5.6, 5.5.7, 5.5.8 and 5.5.9:  
"5.4.4 Within 7 calendar days of receiving a copy of the certificate of Substantial Performance of the *Work* signed by the *Consultant*, the *Contractor* shall publish a copy of the certificate in a construction trade newspaper (as that term is defined in the Construction Lien Act) and shall provide to the *Consultant* and the *Owner* the date of publication and the name of the construction trade newspaper in which the publication occurred. If the *Contractor* fails to comply with this provision, the *Owner* may publish a copy of the certificate and charge the *Contractor* with the costs so incurred.  
5.4.5 Prior to submitting its written application for Substantial Performance of the *Work*, the *Contractor* shall submit to the *Consultant* all:
  - .1 guarantees
  - .2 warranties;
  - .3 certificates;
  - .4 testing and balancing reports;
  - .5 distribution system diagrams;

- .6 spare parts;
  - .7 maintenance manuals;
  - .8 samples;
  - .9 existing reports and correspondence from authorities having jurisdiction in the Place of the Work;
  - .10 Complete as-built drawings
- and other materials or documentation required to be submitted under the *Contract*, together with written proof acceptable to the *Owner* and the *Consultant* that the *Work* has been substantially performed in conformance with the requirements of municipal, governmental, and utility authorities having jurisdiction in the *Place of the Work*.
- 5.4.6 Where the *Contractor* is unable to deliver the documents and materials described in paragraph 5.4.5, then, provided that none of the missing documents and materials interferes with the use and occupancy of the *Project* in a material way, the failure to deliver shall not be grounds for the *Consultant* to refuse to certify *Substantial Performance of the Work*. If the *Contractor* fails to deliver any of the documents or materials required described in paragraph 5.4.5 the *Consultant* shall retain from payments otherwise owing to the *Contractor* under this *Contract* the amount described in paragraph 5.4.7 and retain such amount until such documents and materials are delivered
- 5.4.7 The amount to be retained by the *Consultant* as contemplated in subparagraphs 5.2.10 and 5.4.6 is as follows:
- .1 where the Contract Price is less than \$100,000 the amount to be retained is \$5,000;
  - .2 where the Contract Price is greater than \$100,000 but less than \$500,000, the amount to be retained is 5% of the Contract Price; and
  - .3 where the Contract Price is greater than \$500,000 but less than \$5,000,000, the amount to be retained is the greater of \$25,000 or 3% of the Contract Price.
- 5.4.8 Should the *As-Built Drawings* not be delivered in accordance with subparagraph 5.2.10 or any documents or materials not be delivered in accordance with paragraph 5.4.5 by the earlier of 60 days following publication of the certificate of Substantial Performance of the Work and the submission of the Contractor's application for final payment under paragraph 5.7.1 of General Condition 5.7 – FINAL PAYMENT, then the amount previously retained pursuant to paragraph 5.2.10 or 5.4.7 may be used by the *Owner* to defray the cost of preparing or replacing the documents or materials, or *As-Built Drawings* which the contractor failed to deliver
- 5.4.9 Together with the submission of its written application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* and to the *Owner* a statutory declaration setting forth in reasonable detail any then outstanding and unresolved disputes or claims between the *Contractor* and any *Subcontractor* or *Supplier*, including any claims allegedly arising from delay, which are, directly or indirectly, related to any then outstanding or anticipated disputes or claims between the *Contractor* and the *Owner*, and this disclosure shall, at a minimum
- .1 identify the parties involved;
  - .2 identify the amount in dispute;
  - .3 provide a brief statement summarizing the position of each party;
  - .4 include copies of any correspondence or documents in support of either party's position;
  - .5 include copies of any documents of any court or arbitration process related to the matter;
  - .6 identify the dispute or claim between the Contractor and the Owner to which the matter relates; and
  - .7 include a copy of any written agreement or a summary of any oral agreement between the parties related to resolution of the matter.
- The disclosure requirements detailed herein are of a continuing nature and survive

completion of the *Work*. Accordingly, the *Contractor* shall supplement the information provided with the original statutory declaration with additional materials pertaining to new or existing disputes or claims, as they become available."

**.18 GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK**

**.1 Add new subparagraph 5.5.1.3**

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

**.2 Amend paragraph 5.5.2 by deleting the words "and the statement" from line 1, and adding the following at the end of the paragraph:**

"The Substantial Performance Statutory holdback Release Payment Certificate will be a payment certificate releasing the Contractor the statutory holdback due in respect of the Work performed up to the date of the Substantial Performance of the Work. Payment of such statutory holdback shall be due 61 days after the date of publication of the Certificate of Substantial Performance but subject to the provisions of the *Act* and subject to GC 5.5.4."

**.19 GC 5.7 FINAL PAYMENT**

**.1 Delete from the first line of paragraph 5.7.2 the words, "calendar days" and substitute the words "Working Days".**

**.2 Delete from the second line of paragraph 5.7.4 the words, "...5 calendar days after the issuance..." and substitute the words "...28 calendar days after receipt of a *Proper Invoice*..."**

**.3 Add new paragraph 5.7.5**

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

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

**.20 GC 6.2 CHANGE ORDER**

**.1 Add new paragraph 6.2.3 as follows:**

"6.2.3 The following mark-up shall apply to work added to the Contract

In the case of changes in the Work to be paid for by the Owner under the methods described in paragraph 6.2.2, the Contractor and Subcontractor, respectively, may add to the net cost of additional work, a fee, or markup, inclusive of overhead and profit, limited to the following:

- The General Contractor may add to the total net cost of additional work to be carried out by his own forces, a markup of Ten (10%) per cent. General Contractors are not allowed to treat their own forces as Subcontractors.
- The General Contractor may add to the net cost of additional work by a Subcontractor, a markup, of Five (5%) per cent of the net sum quoted by such Subcontractor
- Subcontractor may add to the total net cost of additional work to be carried out by his own forces, a markup of Five (5%) per cent.
- The Subcontractor may add to the net cost of additional work by a Sub-Subcontractor or Supplier, a markup, of Five (5%) per cent of the net sum quoted by such Sub-Subcontractor or Supplier

Such markup, by General Contractor and Subcontractor, respectively, shall be based on net additional cost for any one change in the Work, such net cost being derived by deducting credits for labour and materials involved in deleted work from the cost of labour and materials involved in additional work. When quantities of the same product or material are changed in the same Change in the Work, the change in the Contract Price shall be based on the net difference in quantity between the product(s) or material(s) deleted and the product(s) or material(s) added.

'Overhead' shall include any additional charges and/or premiums for **Supervision**,

- Permits, Bonds, Insurance, Office Overhead and the like**, which may result from Changes in the Work. The cost for these items shall not be added onto any Cost for Changes prior to applying mark-up.”
- .2 Add new paragraph 6.2.4 and 6.2.5 as follows:
- “6.2.4 All quotations submitted shall be provide with ta detailed breakdown including, but not limited to the following:
1. quantity of each material
  2. unit cost of each material
  3. man hours involved
  4. cost per hour
  5. *Subcontractor* quotations submitted listing items 1 to 4 above and item 6 below.
  6. mark-up”
- 6.2.5 The *Owner* and the *Consultant* will not be responsible for delays to the *Work* resulting from late, incomplete or inadequately broken down valuations submitted by the *Contractor*.”
- .21 **GC 6.3 CHANGE DIRECTIVES**
- .1 Add new paragraph 6.3.14 as follows:
- “6.3.14 Limits to Overhead and Profit as listed in paragraph 6.2.3 shall apply to Change Directives.”
- .22 **GC 6.4 CONCEALED OR UNKNOWN CONDITIONS**
- .1 Add new subparagraph 6.4.5:
- “6.4.5 The Contractor confirms that, prior to bidding the Project, it carefully investigated the Place of the Work and applied to that investigation the degree of care and skill described in paragraph 3.14.1, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the Contractor prior to submission of bid, and the sufficiency and completeness of the information provided by the Owner. The Contractor is not entitled to compensation or to an extension of the Contract Time for conditions which could reasonably have been ascertained by the Contractor by such careful investigation undertaken prior to the submission of the bid.”
- .23 **GC 6.5 DELAYS**
- .1 Delete the period at the end of paragraph 6.5.1, and substitute the following words:  
“....., but excluding any consequential, indirect or special damages.”
- .2 Delete the period at the end of paragraph 6.5.2, and substitute the following words:  
“....., but excluding any consequential, indirect or special damages.”
- .3 Add new subparagraph 6.5.6.
- “6.5.6 If the Contractor is delayed in the performance of the Work by an act or omission of the Contractor or anyone employed or engaged by the Contractor directly or indirectly, or by any cause within the Contractor’s control, then the Contract Time shall be extended for such reasonable time as the Consultant may decide in consultation with the Contractor. The Owner shall be reimbursed by the Contractor for all reasonable costs incurred by the Owner as the result of such delay, including all services required by the Owner from the Consultant as a result of such delay by the Contractor and, in particular, the cost of the Consultant’s services during the period between the date of Substantial Performance of the Work stated in Article A-1 herein as the same may be extended through the provisions of these General Conditions and any later, actual date of *Substantial Performance of the Work* achieved by the *Contractor*.”
- .24 **GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE**
- .1 Delete paragraph 6.6.5. in its entirety and substitute new paragraph 6.6.5.
- “6.6.5. The *Consultant’s* findings, with respect to a claim made by either party will be given by *Notice in Writing* by the *Consultant* to both parties within reasonable time after receipt of

the claim information noted in paragraph 6.6.3.”

.2 Add new paragraph 6.6.7

“6.6.7 The *Owner* may make claims arising out of the costs incurred for additional services provided by the *Consultant* resulting from the *Contractor*’s failure to reasonably perform the Work in accordance with the terms and conditions of the Contract, including the *Contractor*’s issuance of unnecessary Requests for Information. The *Consultant* will notify the *Owner* and *Contractor* where it has been determined that additional services will be required or have been provided in order not to cause a delay. The *Owner* shall make claims based on the *Consultant*’s invoices.”

.25 **GC 8.1 AUTHORITY OF THE CONSULTANT**

.1 Delete last sentence of 8.1.3 and substitute the following sentence:

“If it is subsequently determined that such instructions were at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond the requirements of the *Contract Documents*, including costs resulting from interruption of the *Work*.”

.26 **GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION**

.1 Delete paragraphs 8.2.6, 8.2.7, and 8.2.8 in their entirety and substitute new subparagraph 8.2.6 and 8.2.9 as follows:

“8.2.6 When a dispute has not been resolved through negotiation or mediation, within 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.2.5, either party may give a *Notice in Writing* to the other party and to the *Consultant* inviting the other party to agree to submit the dispute to be finally resolved by arbitration, pursuant to provisions of the *Arbitration Act, 1991*. If the other party wishes to accept the invitation to submit the dispute to arbitration, it shall so indicate by the delivery of a responding *Notice in Writing* within 10 *Working Days* of receipt of the invitation. If, within the required times, no invitation is made or, if made, is not accepted, either party may refer the dispute to the courts or to any other form of dispute resolution, including arbitration, which the parties may agree to use.”

“8.2.9 As permitted by the Construction Act (Ontario), the parties hereby agree that an adjudication under the Construction Act (Ontario) may address more than one matter.”

.27 **GC 9.1 PROTECTION OF WORK AND PROPERTY**

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

“9.1.1.1 errors in the Contract Documents which the Contractor could not have discovered applying the standard of care described in paragraph 3.14.1.”

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

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

.28 **GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES**

.1 Add to paragraph 9.2.6 after the word “responsible”, the following new words:

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

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

.3 Add to paragraph 9.2.8 after the word “responsible”, the following new words:

“.....or that any toxic or hazardous substances or materials already at the Place of the Work



(and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner or others,”

.4 Add “and the Consultant” after the word “Owner” in subparagraph 9.2.8.4.

.29 **GC 9.4 CONSTRUCTION SAFETY**

.1 Add new paragraph 9.4.2. as follows:

“9.4.2 The *Contractor* shall indemnify and save harmless the *Owner*, the *Consultant*, their agents, trustees, officers, directors, employees, successors, appointees, and assigns from and against the consequences of any and all safety infractions committed by the *Contractor* under the occupational health and safety legislation in force at the *Place of the Work* including the payment of legal fees and disbursements on a substantial indemnity basis.”

.30 **GC 9.5 MOULD**

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

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

.31 **GC 10.1 TAXES AND DUTIES**

.1 Add new paragraph 10.1.3 as follows:

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

.32 **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 3.14.1, the”.

.33 **GC 10.4 WORKERS’ COMPENSATION**

.1 Delete paragraph 10.4.1 and replace with the following:

“10.4.1 Prior to commencing the *Work*, and with each and every application for payment thereafter, including the *Contractor’s* application for payment of the holdback amount following *Substantial Performance of the Work* and again with the *Contractor’s* application for final payment, the *Contractor* shall provide evidence of compliance with workers’ compensation legislation in force at the *Place of the Work*, including payments due thereunder.”

.34 **GC 12.1 INDEMNIFICATION**

.1 Add “...and the Consultant, their agents and Sub-Consultants...” after the words “...hold harmless the other...” in paragraph 12.1.1.

.35 **GC 12.3 WARRANTY**

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

END OF SECTION

PART 1 - GENERAL1.1 RESPONSIBILITY

- .1 The Consultant may issue Addenda up to **two (2) days** prior to tender closing to provide revisions to, alterations to, additions to or deletions from the scope of work. Such revisions shall become part of the Contract Documents. Include all costs in Tender Price.
  - .1 Should the Consultant determine it is necessary to issue an addenda after the deadline for issuing and Addenda, the Consultant may do so, but will extend the Submission Deadline, (Tender Close) an appropriate amount of time.
- .2 Addenda will be issued in electronic format only (PDF) to Construction Associations
  - .1 Contractors shall be responsible for providing printing of documents as may be required.
- .3 Tenderers shall be held responsible to ensure that the Work of all issued Addenda is included in their Tender.
- .4 Indicate, in the space provided, on the Tender Form the number of Addenda included in the Tender.
- .5 Attach addenda following this section.

PART 2 - PRODUCTS

- .1 Not Applicable

PART 3 - EXECUTION

- .1 Not Applicable

End of Section

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 01 11 00  
SUMMARY OF WORK  
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## 1.0 - GENERAL

### 1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises generally of the scope described below in text, and specifically as outlined in the foregoing drawings, specifications and contract documents.

### 1.2 SCOPE OF THE WORK.

- .1 The following is an outline of the scope of work for this project. Tenderers are required to review all contract documents for a complete description of the scope of work.
- .2 This contract requires a series of Barrier Free upgrades for the facility: Our Lady of Fatima Catholic School. Work is to be carried out on Exterior Walkways, in Public Washrooms, Storage Areas, Stairwells and throughout the facility for door, hardware and signage replacements. The scope of project is further described in the balance of the contract documents, including the drawings and specifications.
- .3 All construction activities associated with this project must be carefully scheduled with the Owner to allow continued access to the school and for the work to be complete ahead of resuming school operations in September 2023.

### 1.3 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Consultant.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Consultant, in writing, any defects which may interfere with proper execution of Work.

### 1.4 CONTRACTOR USE OF PREMISES

- .1 General: the Contractor shall have full, but shared use of subject areas at project sites for construction operations during the designated summer construction period. Coordinate construction areas and staging with the Consultant and Owner at Pre-construction meeting.
- .2 Provide and maintain temporary construction access to work zone as needed.
- .3 Obtain and pay for use of additional storage or work areas as needed for operations under this Contract.
- .4 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .5 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Consultant.
- .6 All adjacent floor areas will continue to be operational during all phases of construction and therefore the Contractor must take special precautions to:

## Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 01 11 00  
SUMMARY OF WORK  
Page 2 of 2

- .1 Maintain a clean and safe construction site
- .2 Observe strict contamination control standards
- .3 Cooperate with the Owner in all respects so that there is as little or no interference to the ongoing operations.
- .4 Limit all activities (i.e., demolition, material delivery, material removal) which could disturb the current operation

### 1.5 OWNER OCCUPANCY

- .1 Our Lady of Fatima operates as an elementary school building. The school building will be available on a continuous basis for construction between **July 3<sup>rd</sup> to August 25<sup>th</sup>, 2023**. During this time the owner may require access to the school building on a regular basis for execution of normal summer maintenance and cleaning operations. Teachers will require regular access one week after school ends, and two weeks before it begins.
- .2 Construction activities will be carefully coordinated so as to allow the HSCDSB with access to the facilities during the stated summer month construction period and to return as fully operational for the designated 2023/24 Academic School year; beginning September 4<sup>th</sup>, 2023. Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner operation of surrounding premises. Owner's Care staff will be working within areas of the facilities throughout the summer months.

### 1.6 GEOTECHNICAL REPORT

- .1 Not Applicable.

### 1.7 HAZARDOUS BUILDING MATERIALS

- .1 In case of observations on site advise the Owners Representative in writing prior to proceeding with the work.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not used.

END OF SECTION

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 01 14 00  
WORK RESTRICTIONS  
Page 1 of 2

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PART 1 - GENERAL

- |   |    |  |
|---|----|--|
| <u>1.1 ACCESS AND EGRESS</u>                                      | .1 | Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.  |
| <br>  |    |  |
| <u>1.2 USE OF SITE AND FACILITIES</u>                             | .1 | Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Consultant and Owner to facilitate work as stated.  |
|   | .2 | Maintain existing services to building and provide for personnel and vehicle access.   |
|   | .3 | Where security is reduced by work provide temporary means to maintain security.  |
|   | .4 | Contractor has access to existing washroom facilities within the building. Keep facilities clean.  |
|   | .5 | Closures: protect work temporarily until permanent enclosures are completed.   |
| <br>  |    |  |
| <u>1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING</u> | .1 | Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Consultant/Owner to facilitate execution of work.  |
| <br>  |    |  |
| <u>1.4 EXISTING SERVICES</u>                                      | .1 | Notify Consultant and utility companies of intended interruption of services and obtain required permission.   |
|   | .2 | Where Work involves breaking into or connecting to existing services, provide Consultant four (4) days' notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends. |
|   | .3 | Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.  |
| <br>  |    |  |
| <u>1.5 SPECIAL REQUIREMENTS</u>                                   | .1 | Carry out noise generating Work in accordance with provincial and municipal requirements and by-laws.  |
|   | .2 | Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.  |
|   | .3 | Keep within limits of work and avenues of ingress and egress.  |

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## Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
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WORK RESTRICTIONS  
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- 1.6 SECURITY CLEARANCES .1 All personnel employed for certain aspects of this project, may be subject to CPIC security check. If requested, obtain and pay for security clearance(s), for each individual requested. This requirement is likely to come into effect in the event that construction activities extend into scheduled occupancy of the facilities during the 2022/2023 school year.
- .1 Maintain a master list of all personnel cleared for work on the site.
- .2 Remove from site any persons not cleared for work on the site.
- .2 Co-Operate with personnel in meeting with the security requirements set out for this project by them and defined during the construction phase.
- 1.7 BUILDING SMOKING ENVIRONMENT .1 Comply with Owners smoking restrictions.
- .1 Smoking is not permitted on provincially owned school property at any time, including during all phases of construction.
- .2 Enforce Owners smoking restrictions.

### PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

### PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

END OF SECTION

# Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 01 21 00

ALLOWANCES

Page 1 of 2

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 Section 00 03 00 – Tender Form
- .2 Section 01 11 00 – Summary of Work

### 1.2 ALLOWANCES

- .1 Allowances shall be expended by a written order signed by the Owner or Owner Representative.
- .2 Should it be required, the Contract Price will be adjusted, by written order, to provide for a deficit to any allowance.
- .3 Include with each progress payments a summary of all allowances. Include the total amount, amount expended to date, amount applied for with new application (include supporting documentation)
- .4 If entire allowance is not required to be expended against at the end of the project, the entire residual value will be retained by the owner, or at any time during the project at the owner's discretion.

### 1.3 CASH ALLOWANCES

- .1 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, Installation and other authorized expenses incurred in performing Work.
- .2 The Contract Price, and not cash allowance, shall include the Contractor's Overhead and Profit in connection with such cash allowance.
  - .1 Where costs under an allowance exceed amount of allowance, the Contractor will be compensated for excess incurred, and substantiated, plus allowance for Overhead and Profit.
- .3 Include the following amounts in the Contract Price for each respective cash allowance, for Work specified in respective specification Sections, as follows.

.1	<b>Signage Allowance</b>	<b>\$ 600.00</b>
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### 1.4 CONTINGENCY ALLOWANCE

- .1 Contingency Allowances, unless otherwise specified, cover total cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, Installation and other authorized expenses incurred in performing Work.
- .2 The Contingency Allowance, and not contract price, shall include the Contractor's Overhead and Profit in connection with such cash allowance.
- .3 Include the following Contingency Allowance in the Contract Price.

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

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Section 01 21 00

ALLOWANCES

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.1	<b>Contingency Allowance</b>	<b>\$ 15,000.00</b>
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- .4 Expenditures under Contingency Allowance will be authorized by issuance of a Change Order only.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not Used.

END OF SECTION



**PART 1 - GENERAL****1.1 SECTION INCLUDES**

- .1 Product Installation Alternatives to Agreement to the Work
- .2 Incorporation of Accepted Alternatives into Agreement

**1.2 RELATED SECTIONS**

- .1 Division 1 – General Requirements
- .2 Section 01 41 13 - Tender Form Appendix B

**1.3 REQUIREMENTS**

- .1 Referenced specification Sections stipulate pertinent requirements for products and methods to achieve the Work stipulated under each item listed.
- .2 Coordinate affected related Work and modify surrounding Work to integrate the Work under each item listed.
- .3 Unless otherwise noted, all prices shall include all labour, material, delivery, equipment, tools, scaffolding etc., necessary and required for the complete installation of the work noted. Prices shall include all overhead and profit and shall exclude Harmonized Sales Tax.
- .4 All prices submitted take into consideration and allow for changes and adjustments in other work as may be necessary to provide a finished and functional result, unless specifically indicated otherwise.
- .5 Should the acceptance, by the Owner, of any Separate or Alternate Prices necessitate the use of an alternate subcontractor for work of a particular section, list such subcontractors below applicable prices indicated in the tender form. If no subcontractor is indicated, the subcontractors indicated in the tender form appendix form shall be used.

**1.4 AWARD/SELECTION OF  
ALTERNATE AND SEPARATE  
PRICES**

- .1 Indicate variation of Bid Price for Alternatives described below and listed in Tender Form. Note that this form requests a 'difference' in Price by adding to or deducting from the base bid price.
- .2 In accordance with CCDC Document No. 23 "A Guide to Calling Bids and Awarding Contracts", the low Tender shall be determined on basis of lowest Tender in accordance with Contract Documents on which Project is to be actually constructed, including those Separate and Alternate price options for which prices have been invited and which are to be incorporated in the Work.
  - .1 The following provides the owners priority for acceptance of the Separate and alternate Prices.
    - .1 Priority One. – Separate Price Option 01

**1.5 DEFINITIONS**

- .1 **Separate Prices** – Are prices for additional work that is to be added to the contract, in addition to the base contract work. Unless specifically stated, all separate prices are in addition to the base tender amount.

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SEPARATE AND ALTERNATE PRICES

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.1 All prices shall include all labour, material, delivery, equipment, tools, scaffolding etc., necessary and required for the complete installation of the work noted. Prices shall include all overhead and profit but shall exclude Harmonized Sales Tax

.2 **Alternate Prices** – Are prices for work that is to be provided in lieu of work that is currently specified or detailed in the tender documents. As this work is in lieu of work currently specified this work may be in addition to or a reduction from the base tender amount. As such this amount must be identified on the tender form as indicated.

.1 All prices shall include all labour, material, delivery, equipment, tools, scaffolding etc., necessary and required for the complete installation of the work noted. Prices shall include all overhead and profit but shall exclude Harmonized Sales Tax

#### 1.6 REFERENCES

.1 Reference locations provided in this section are for general information only and shall not be considered as a complete reference guide to all instances of drawing and/or specification references. It shall be the responsibility of the Contractor to coordinate all work as described here and elsewhere in the Contract Documents.

#### 1.7 SEPERATE PRICES

.1 Separate Price Option No. 1 (**SPO-01**) – **Roof Access Ladder and Roof Access Hatch.**

#### 1.8 ALTERNATE PRICE

.1 None.

#### PART 2 - PRODUCTS

.1

#### 2.1 NOT USED

.1 Not Used.

#### PART 3 - EXECUTION

.1

#### 3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL1.1 RELATED REQUIREMENTS .1 Section 01 77 00 – Closeout Procedures1.2 APPLICATIONS FOR  
PROGRESS PAYMENT

- .1 Schedule of Values Review. See article 1.3 below
- .2 Make applications for payment on account monthly as Work progresses.
- .3 Date applications for payment last day of monthly payment period.
  - .1 The application for payment from the General Contractor will not be submitted to the Consultant before the 25th of any month
- .4 Assemble review and coordinate the applications of all sub-trades and suppliers and ensure that the amount claimed shall be for the value, proportionate to the amount of the *Contract*, of *Work* performed, and *Products* delivered to the *Place of the Work*, that may be incorporated into the work in the following 30 days, as of the last day of the payment period.
- .5 The procedure for making an application for payment, or “Proper Invoice” shall be complete with the following documentation
  - .1 Summary statement/invoice cover letter listing
    - .1 Contractors name and address
    - .2 Date of Invoice
    - .3 Invoice Period
    - .4 Amount billed.
    - .5 Holdback retained
    - .6 HST
    - .7 Total Amount Owed
    - .8 Name, title, telephone number and mailing address of the person to whom payment is to be sent.
    - .9 Signature of Authorized agent.
    - .10 List of prescribed attachments (including the following as a minimum)
  - .2 Schedule of Values with Percentage Work Completed aggregating total amount of value being claimed and indicating percentage of work complete proportionate to the amounts of each division of work.
  - .3 Statutory Declaration from the General Contractor that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in performance of the work up to and including the date of the Application for Payment, and for which Owner might in be held responsible, have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.
  - .4 Workplace Safety & Insurance Board interim release for the General Contractor

1.3 SCHEDULE OF VALUES

- .1 Schedule of Value Review
  - .1 Submit a Sample Schedule of Values to the Consultant, a minimum of fourteen (14) days before first application for payment for review.
  - .2 Include a breakdown of all work including: material and labour, for each trade, phase, project area, for the Work, in sufficient detail as may be requested by the Consultant, to allow for a proper evaluation of payment applications. Provide additional supporting documentation as the consultant may so request.
    - .1 A sample Schedule of Values template has been included in this Section and is an acceptable format that can be used.
  - .3 Materials not being on site are not eligible for payment under this section.

1.4 PROGRESS PAYMENT

- .1 Consultant will issue to Owner, no later than ten (10) working days after receipt of an application.
  - .1 A Certificate of Payment (COP) in amount applied for. And include a cover letter indicating when the contractor should receive payment in accordance with the Construction Act.  
or
  - .2 A Certificate of Payment (COP) in the amount approved by the Consultant and a "Notice of Non-Payment" indicating the amounts not agreed with in the Contractors application. And include a cover letter indicating when the contractor should receive payment in accordance with the Construction Act.  
or
  - .3 Notify the Contractor that a "Proper Invoice" was not received and request that the outstanding information be submitted
- .2 Owner will pay the contractor in accordance with the Certificate of Payment and the Construction Act, not more than Twenty-Eight (28) days from receipt of a Proper Invoice, as will be indicated in the consultants cover letter accompanying the Certificate of Payment.
  - .1 In the case that Twenty-Eight (28) period falls on a weekend or holiday, payment will be due the working day before the weekend or holiday.

1.5 SUBSTANTIAL  
PERFORMANCE OF WORK

- .1 "Substantial Performance" of the work shall be as legislated by the requirements of the Construction Act, current version, at the date the project Contract was signed, and as supplemented herein.
- .2 The Contractor shall review the work and the requirements for substantial performance as indicated here and in section 01 77 00 – Closeout Procedures, and as per the Construction Act and provide all necessary proof and supporting documentation required to apply for Substantial performance.
- .3 The Consultant will review the application and determine and indicate the date of Substantial Performance of Work

- .1 If approved the Consultant will issue a Certificate of Substantial Performance on behalf of the Owner. This will be circulated to the Contractor and the Owner.
- .4 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish a reasonable date for finishing Work.
- .5 Certificates of payment will not be issued past substantial completion until Total Completion is achieved.
  - .1 The contractor must complete all outstanding work and provide a signed completed deficiency list and a letter from the Contractors Project Manager confirming that the Work of the project has achieved Total Completion.
  - .2 Only upon receipt of this letter will the Consultant and Owners Representative review the site to confirm the Deficiency are complete.
  - .3 Cost for additional inspections by the Consultant, Consultant Team and Owner Representative shall be borne by the Contractor.
- .6 Refer also to section 01 77 00 – Closeout Procedures for additional instructions/requirements regarding Substantial Performance.

#### 1.6 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

- .1 Payment of Holdback shall follow the requirements of the Construction Act, current version, and as supplemented here.
- .2 After issuance of certificate of Substantial Performance of Work:
  - .1 Submit separate application for payment of holdback amount.
  - .2 Include a Statutory Declaration that accounts for all labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.
- .3 After receipt of application for payment and sworn statement, Consultant will within seven (7) working days, issue certificate for payment of holdback amount to the Owner.
- .4 Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between parties. Owner may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor which are enforceable against Owner.

#### 1.7 PROGRESSIVE/EARLY

- .1 Early and or Progressive release of holdback may be provided as the

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

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Section 01 29 00  
PAYMENT PROCEDURES  
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**RELEASE OF HOLDBACK**

Construction Act permits.

- .1 Review the Act and make application for early release of holdback in conformance with the Act.

**PART 2 - PRODUCTS****2.1 NOT USED**

- .1 Not Used.

**PART 3 - EXECUTION****3.1 NOT USED**

- .1 Not Used.

END OF SECTION

Barrier Free Our Lady of Fatima Catholic School																21026b	
APPLICATION for PAYMENT (minimum requirements)														(Contractor Name)			
AfP# (??)														(Date)			
No.	Description	Value (\$)	Complete to date (%)	Amount (\$)	Previously billed (%)	Amount (\$)	This Invoice (%)	Amount (\$)	Amount to complete (%)	Amount (\$)							
<b>ALLOWANCES</b>																	
	List each as separate item as defined in Section 012100. See bottom of sheet for required itemized breakdown of each item																
<b>DIVISION 1 - GENERAL CONDITIONS</b>																	
	Bonds and Insurance																
	Building Permit																
	Temporary Power & Lights																
	Temporary Heating & Ventilation																
	Cold Weather (Heating & Hoarding)																
	Temporary Barriers and Signage																
	General Cleaning																
	Final Cleaning																
	Construction Meeting Minutes & Schedule																
	Commissioning (General Requirements)																
	As Built (arch - all series)																
	Final Survey Drawing																
	General Administration																
	Site Compound/Offices																
	Office Ongoing Costs																
	Demobilization																
	Building Management Manual																
<b>DIVISION 2 - EXISTING CONDITIONS</b>																	
	Abatement																
	Demolition																
<b>DIVISION 3 - CONCRETE</b>																	
	Concrete (Mob/Demob)																
	Formwork - Footings																
	Formwork - Foundation Walls & Piers																
	Formwork - Shear Walls, Stairs and Elevators																
	Reinforcing (Shop Drawings)																
	Reinforcing (Material)																
	Reinforcing (Labour)																
	Cast-in Place - Footings (Material)																
	Cast-in Place - Footings (Labour)																
	Cast-in Place - Foundation Walls & Piers (Material)																
	Cast-in Place - Foundation Walls & Piers (Labour)																
	Cast-in Place - Shear Walls, Stairs and Elevators (Material)																
	Cast-in Place - Shear Walls, Stairs and Elevators (Labour)																
	Cast-in Place - Floors (Material)																
	Cast-in Place - Floors (Labour)																
	Floor Finishing - Slab on Grade																
	Floor Finishing - Slab on Deck																
<b>DIVISION 4 - MASONRY</b>																	
	Mason (Mob/Demob)																
	Concrete Unit Masonry (Material)																
	Concrete Unit Masonry (Labour)																
	Exterior Brick/Block Unit Masonry Veneer (Material)																
	Exterior Brick/Block Unit Masonry Veneer (Labour)																
	Masonry Cleaning																
<b>DIVISION 5 - METALS</b>																	
	Structural Steel (Mob/Demob)																
	Structural Steel Framing (Shop Drawings)																
	Structural Steel Framing (Material)																
	Structural Steel Framing (Labour)																
	Metal Deck (Mob/Demob)																
	Metal Deck (Shop Drawings)																
	Metal Deck (Material)																
	Metal Deck (Labour)																
	Metal Fabrications (Mob/Demob)																
	Metal Stairs and Handrails (Shop Dwg)																
	Metal Stairs and Handrails (Material Labour)																
	Metal Fabrications (Shop Drawings)																
	Metal Fabrications (Material Labour)																
	Structural Metal Stud Framing (Mob/Demob)																
	Structural Metal Stud Framing (Shop Drawings)																
	Structural Metal Stud Framing (Material)																
	Structural Metal Stud Framing (Labour)																
<b>DIVISION 6 - WOOD &amp; PLASTICS</b>																	
	Rough Carpentry (Material)																
	Rough Carpentry (Labour)																
	Finish Carpentry (Shop Drawings)																
	Finish Carpentry (Material)																
	Finish Carpentry (Labour)																





## APPLICATION for PAYMENT (minimum requirements)

(Contractor Name)

AfP# (??)

(Date)

No.	Description	Value (\$)	Complete to date		Previously billed		This Invoice		Amount to complete	
			(%)	Amount (\$)	(%)	Amount (\$)	(%)	Amount (\$)	(%)	Amount (\$)
	Wet Pipe Sprinkler System									
	Dry Pipe Sprinkler System									
<b>DIVISION 22 - PLUMBING</b>										
	Mobilization									
	Interference Drawings									
	Shop Drawings									
	Commissioning									
	O & M Manuals									
	As Builts									
	Plumbing Fixtures (Material)									
	Plumbing Fixtures (Install)									
	Domestic Water Distribution									
	Below Grade Waste and Vent									
	Below Grade Storm									
	Above Grade Storm									
	Above Grade Sanitary/Vent									
	Natural Gas									
	Insulation									
<b>DIVISION 23 - Heating, Ventilating &amp; Air Conditioning</b>										
	Mobilization									
	Interference Drawings									
	Shop Drawings									
	Commissioning									
	O & M (Manuals)									
	As Builts									
	Boilers (Material)									
	Boilers (Install)									
	Vibration Isolation									
	Chemical Treatment									
	HVAC Duct (Material)									
	HVAC Duct (Install)									
	HVAC Accessories & Finishes									
	Exhaust Fans									
	Air Handling Units									
	Air Balancing									
	Water Balancing									
	Insulation									
<b>DIVISION 25 - AUTOMATION</b>										
	Mobilization									
	Shop Drawings									
	Conduit & Cabling Supply									
	Conduit & Cabling Install									
	Equipment Supply									
	Equipment Install									
	Commissioning									
	As Built Drawings									
<b>DIVISION 26 - ELECTRICAL</b>										
	Mobilization									
	Interference Drawings									
	Devices & Wiring Material									
	Devices & wiring Labour									
	Generator Supply									
	Generator Install									
	Active Harmonic Filtering									
	Distribution - Labour									
	Distribution - Material									
	Feeders - Labour									
	Feeders - Material									
	Hand Dryers Labour									
	Hand Dryers Material									
	Lighting - Labour									
	Lighting - Material									
	Lighting Controls Labour									
	Lighting Controls Material									
	Tray & Floor Boxes Labour									
	Tray & Floor Boxes Material									
	Commissioning									
	As Built Drawings									
<b>DIVISION 27 - COMMUNICATIONS</b>										
	Mobilization									
	Interference Drawings									
	Data Racks & Equipment									
	Data Conduit & Provisioning									
	Data Wiring									
	As Built Drawings									

## APPLICATION for PAYMENT (minimum requirements)

(Contractor Name)

AfP# (??)

(Date)

No.	Description	Value (\$)	Complete to date (%)	Amount (\$)	Previously billed (%)	Amount (\$)	This Invoice (%)	Amount (\$)	Amount to complete (%)	Amount (\$)
<b>DIVISION 28 - ELECTRONIC SAFETY AND SECURITY</b>										
	Fire Alarm System Supply									
	Fire Alarm System Install									
	Commissioning									
	Gates									
	Security Supply									
	Security Install									
	CCTV Supply									
	CCTV Install									
	As Built Drawings									
<b>DIVISION 31 - EARTHWORK</b>										
	(review this portion of the list with Civil Consultant)									
	Clearing and Grubbing									
	Earthwork									
	Geotextiles									
	Excavating, Trenching & Backfill									
	Rough Grading									
	Finish Grading									
<b>DIVISION 32 - EXTERIOR IMPROVEMENTS</b>										
	(review this portion of the list with Civil and Landscape)									
	Granular Subbase									
	Aggregate Base Course									
	Asphalt Paving (civil)									
	Pavement Markings									
	Concrete Walks, Curbs & Gutters (civil)									
	Concrete Walks, Curbs & Gutters (landscape)									
	Asphalt walks and tracks (landscape)									
	Sand Beds									
	Artificial Turf									
	Chain Link Fences									
	Architectural Fences									
	Exterior Site Furnishings									
	Exterior Play Structures (material)									
	Topsoil Placement and Grading									
	Hydraulic Seeding									
	Sodding									
	Trees									
	Plants									
<b>DIVISION 33 - SITE INFRASTRUCTURE</b>										
	(review this portion of the list with Civil Consultant)									
	Manholes and Catch basins									
	Site Water Utility Distribution Piping									
	Sanitary Utility Sewage Piping									
	Storm Utility Drainage Piping									
	Weeping Drains and Sub-drains									
	Sub-drainage Piping									
<b>Subtotals</b>		0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
<b>Change Orders / Change Directives</b>										
co#1	??									
	??									
	??									
	??									
<b>Subtotals</b>		0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00

Holdback

Subtotals

Holdback Release

Subtotal

HST

Amount Due for this Progress Draw

**APPLICATION for PAYMENT (minimum requirements)**

(Contractor Name)

**AfP# (??)****(Date)**

No.	Description	Value (\$)	Complete to date		Previously billed		This Invoice		Amount to complete	
			(%)	Amount (\$)	(%)	Amount (\$)	(%)	Amount (\$)	(%)	Amount (\$)
Allowance Expenditures (summary of individual expenditures of each allowance)										
Allowance #1 (name from list in Section 012100)										
	??									
	??									
	??									
Subtotals		0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Allowance #2 (name from list in Section 012100)										
	??									
	??									
	??									
Subtotals		0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Allowance #3 (etc.) (name from list in Section 012100)										
	??									
	??									
	??									
Subtotals		0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00

PART 1 - GENERAL1.1 SUMMARY

- .1 Section includes administrative provisions for the coordinating construction operations on the Project including, but not limited to, the following:
- .1 General coordination procedures
  - .2 Construction superintendent
  - .3 Coordination drawings
  - .4 Building Permit
  - .5 Regulatory requirements
  - .6 Requests for information (RFI's)
  - .7 Project Meetings - General
  - .8 Preconstruction Meeting
  - .9 Project Meetings - OAC
  - .10 Project Meeting - CRM
  - .11 Project close-out meeting.
- .2 Every contractor and sub-contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to specific contractor(s).

1.2 GENERAL COORDINATION PROCEDURES

- .1 Coordination: Coordinate construction operations included in different sections of the specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different sections, that depend on each other for proper installation, connection, and operation
- .1 Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation
  - .2 Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - .3 Make adequate provisions to accommodate items scheduled for later installation.
  - .4 Expedite all Section to cooperate with each other to complete the work efficiently, to maintain the construction schedule and correctly to the requirements of the Contract Documents
  - .5 Examine the work of all trades during construction progress and ensure that all the work in conformance with the Contract Documents.
  - .6 Be responsible to coordinate all forms, centering, templates, anchors, sleeves, inserts, chases, openings and accessories required to be fixed or inserted in the work of others to accommodate the work of all trades
    - .1 Either set in place or give complete instructions as to location, size, and the like, to the related trade for installation on your behalf and at your expense.
    - .2 Pay the cost of additional work and make up lost time resulting from failure to provide in the necessary

time, information and co-operation, in adequate time for the same to be incorporated in the work of other trades

- .2 Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings
  - .1 Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

### 1.3 CONSTRUCTION SUPERINTENDANT

- .1 Refer to the General Conditions of the Contract, and as augmented herein:
- .2 The Contractor shall provide a full-time Construction Superintendent for the project.
  - .1 The Construction Superintendent must remain on site for all phases of the construction until "Total Performance" of the Contract has been achieved.
  - .2 The Construction Superintendent shall be the individual identified in the tenderer's proposal document submitted during the prequalification phase, or other, as acceptable to the Owner and Consultant.
- .3 The Construction Superintendent must be experienced in projects of similar size and nature as this proposed project.
  - .1 The Consultant may request references for the proposed superintendent.
    - .1 Should the proposed Construction Superintendent be deemed unsuitable, at the express discretion of the Owner and Consultant, the Contractor shall provide an alternate acceptable Construction Superintendent with no adjustment in the Contract Price or Time.
- .4 The Construction Superintendent shall represent the Contractor on site, directions given to him by the Consultant or Owner shall be as given to the Contractor. The Construction Superintendent must have the authority to make binding decisions on behalf of the Contractor.
- .5 The Construction Superintendent shall not be changed except for good reason and only then after consultation with, and agreement by, the Owner and Consultant
- .6 The Contractor shall request and ensure that all trades employ satisfactory, experienced and qualified supervisors for their sections of work.

### 1.4 SITE DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.

- .5 Shop Drawings submission list.
- .6 Change Master list, and copies of change related paperwork
  - .1 Change Notice
  - .2 Change Orders, Change Directive
- .7 Other Modifications to Contract.
- .8 Field Test Reports.
- .9 Work Schedule, Original and all updates
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified, or as may be requested.

#### 1.5 COORDINATION DRAWINGS / .1 INTERFERENCE DRAWINGS

Coordination Drawings, General: The Contractor shall prepare Colour-coded coordination drawings (also known as, interference drawings) to properly co-ordinate the work of all trades. Prepare coordination drawings according to requirements in individual sections, and additionally where installation is not completely shown on Contract Documents, Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

- .2 Prepare drawings indicating relationship of new and existing and/or unforeseen conditions, prior to commencement of work in any areas.
- .3 For congested locations, before commencing installation, prepare detailed drawings of all trades affected and coordinate installation to fit within existing designed Architectural and Structural parameters.
- .4 Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable
  - .1 Use applicable drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components
  - .2 Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
  - .3 Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
  - .4 Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation
  - .5 Show location and size of access doors required for access to concealed dampers, valves, and other controls
  - .6 Indicate required installation sequences.
  - .7 Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted

- equipment and minimum clearance requirements.
- .1 Provide alternate sketches to Architect indicating proposed resolution of such conflicts.
- .2 Minor dimension changes and difficult installations will not be considered changes to the Contract.
- .3 Allow minimum of fifteen (15) working days to review proposed alternates.
- .4 Do not proceed until adjustments are reviewed
- .5 Coordination Drawing Organization: Organize coordination drawings as follows
  - .1 Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work
  - .2 Plenum Space: Indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components
  - .3 Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment
  - .4 Structural Penetrations: Indicate penetrations and openings required for all disciplines
  - .5 Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items
  - .6 Mechanical and Plumbing Work: Show the following:
    - .1 Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems
    - .2 Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment
    - .3 Fire-rated enclosures around ductwork
  - .7 Electrical Work: Show the following:
    - .1 Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger
    - .2 Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations
    - .3 Panel board, switch board, switchgear, transformer, bus-way, generator, and motor control center locations
    - .4 Location of pull boxes and junction boxes, dimensioned from column center lines

- .8 Fire-Protection System: Show the following:
  - .1 Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads
- .6 General Contractor Review: The General Contractor shall review the final coordinated submittal prior to submission to the Consultant. The General Contractor shall stamped, date and signed the submission. Date and signature shall indicate that all trades have reviewed and coordinated the required installation. Submit final drawings to Consultant for record purposes
- .7 Architect/Consultant Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If the Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit
- .8 Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."
- .9 The contractor shall bear all costs associated for the preparation, copying, distribution, submission, changes and re-submission(s) as may be required of these drawings
- .10 Advise and coordinate with all affected trades of the final Coordination Drawings.
- .11 Maintain record set of all changes for Record Drawings

## 1.6 BUILDING PERMIT

- .1 Building Permits
  - .1 The Contractor shall be responsible for the application for the Building Permit on behalf of the project.
    - .1 The Building Permit will be paid for by the Contractor.
    - .2 Coordinate and provide to the Authorities Having Jurisdiction, any and all responses required from all parties to satisfy any questions arising out of the building permit application.
  - .2 Provide authorities having jurisdiction with any and all information as may be requested throughout the course of the project.
    - .1 Coordinate and provide, any and all information required from all parties to satisfy any questions that may be provided.
  - .3 The Contractor shall notify the Chief Building Official or the registered code agency where applicable, of the readiness, substantial completion, and completion of the stages of construction as set out in the Ontario Building Code.
    - .1 The Contractor shall be present at each site inspection by an inspector or registered code agency



- as applicable under the Ontario Building Code.
- .2 The Contractor shall take minutes of these meetings and distribute copies to any and all persons, companies necessary and required to resolve all issues.
- .3 The contractor shall collect and coordinate the response with the various parties and provide a consolidated response to the authorities having jurisdiction.

.2 Other Permits

- .1 Make application for and obtain any and all other permits on behalf of the project.
  - .1 These permits will be applied for, paid and executed for by the Contractor or his sub-trades.
  - .2 Include the cost in the Stipulated Sum Tender Price.
  - .3 Coordinate and provide to the Authorities Having Jurisdiction, any and all responses required from all parties to satisfy any questions arising out of the building permit application.

## 1.7 REGULATORY REQUIREMENTS

- .1 Building Codes
  - .1 The project work has been documented to comply with the requirements of the Ontario Building Code and all amendments to date
  - .2 Modifications to the project must not reduce the requirements of the Ontario Building Code.
  - .3 Conform to local by-laws which amend or expand upon the requirements of the Ontario Building Code.
  - .4 Conform to Ontario Fire Code, latest amendment
- .2 Safety Codes
  - .1 Comply with the requirements of the Ontario Ministry of Labour specifically, and municipal and/or federal authorities as applicable for construction safety on this project
  - .2 Contractor to include all costs for temporary facilities necessary to comply with safety standards
  - .3 Conform to local by-laws which amend or expand upon the requirements of the Ontario Building Code
- .3 Ministry of Labour – Constructor Guidelines
  - .1 Comply with the requirements of the Occupational Health and Safety Branch Ministry of Labour – Constructor Guidelines – March 2009.

## 1.8 REQUESTS FOR INFORMATION (RFI's)

- .1 General: Review Contract Documents ahead of work required for the project and submit RFI's in a timely fashion so as to not delay the work. Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified
  - .1 Architect will return RFIs submitted to Architect by other

- entities controlled by Contractor with no response
  - .2 Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors
- .2 Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following
  - .1 Project name
  - .2 Project number
  - .3 Date.
  - .4 Name of Contractor
  - .5 Name of Architect
  - .6 RFI number, numbered sequentially
  - .7 RFI subject
  - .8 Specification: Section Title, Section Number, Article and Item number and related paragraphs, as appropriate
  - .9 Drawing: Number, and location reference and photocopy/printed scan of portion of drawing as may be required to fully describe information required.
  - .10 Field dimensions and conditions, as appropriate
  - .11 Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI
  - .12 Contractor's signature
  - .13 Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation
    - .1 Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- .3 Architect's Action: Architect will review each RFI, determine action required, and respond. Allow ten (10) working days for Architect's response for each RFI.
  - .1 The following Contractor-generated RFIs will be returned without action
    - .1 Requests for approval of submittals
    - .2 Requests for approval of substitutions
    - .3 Requests for approval of Contractor's means and methods.
    - .4 Requests for coordination information already indicated in the Contract Documents.
    - .5 Requests for adjustments in the Contract Time or the Contract Sum.
    - .6 Requests for interpretation of Architect's actions on submittals.
    - .7 Incomplete RFIs or inaccurately prepared RFIs.
  - .2 Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information
  - .3 Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.

- .1 If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within three (3) days of receipt of the RFI response.\
- .4 The Consultant shall endeavor to provide, with reasonable promptness, written responses to requests from the Contractor for clarification and interpretation of the requirements of the Contract Documents. Such services shall be provided as part of the Consultants Services. \_\_ However, if the Contractors' requests for information, clarification or interpretation are, in the Consultant's professional opinion, for information readily apparent from reasonable observation of field conditions or a review of the Contract Documents, or are reasonable inferable therefrom, the Consultant **shall** be entitled to compensation for Additional Services in accordance with their agreement with the Owner, for time spent responding to such Requests. In turn, the Owner shall deduct these costs, plus a reasonable mark-up, from the Contractors payment applications.
- .4 RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit up-to date log bi-weekly at commencement of OAC construction meetings. Log shall include no less than the following:
  - .1 Project name
  - .2 Name and address of Contractor
  - .3 RFI number including RFIs that were returned without action or withdrawn
  - .4 RFI description/title
  - .5 Date the RFI was submitted
  - .6 Date Architect's response was received.
- .5 On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three (3) days if Contractor disagrees with response
  - .1 Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate
  - .2 Identification of related Site Instruction, Change Order, Change Directive, and Proposal Request, as appropriate

#### 1.9 PROJECT MEETINGS - GENERAL

- .1 Schedule and administer project meetings throughout the progress of the work at bi-weekly intervals on a day and time coordinated with the Owner and Consultant.
- .2 Prepare agenda for meetings.
- .3 Send a re-occurring meeting request to Owner, Tenant, Consultants, Sub-Consultants, Sub-Contractors and other pertinent parties as required by the phase and progress of the work.

- .4 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.
- .5 Preside at meetings.
  - .1 Take attendance of each meeting.
  - .2 Record the meeting minutes accurately and without bias to any party.
  - .3 Include significant proceedings and decisions.
  - .4 Do not include additional items not discussed at the meeting
  - .5 Identify actions by parties.
  - .6 Distribute the meeting minutes within two (2) days of the meeting.
- .6 If, in the opinion of the Owner and Consultant, the meeting minutes are not being recorded accurately, or are showing undue bias to any party, the consultant may assume the responsibility of producing the meeting minutes and deduct and bill the Owner for this additional service. The Owner in turn will deduct these costs from the payment applications.

#### 1.10 PRECONSTRUCTION MEETING

- .1 Within five (5) days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior Representatives of Owner, Consultant, Sub Consultants, Contractor, major Subcontractors, field inspectors and Supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum two (2) days before meeting.
- .4 Agenda to include:
  - .1 Appointment of Official Representative for the project
    - .1 Include name, title, organization and contact information.
  - .2 Schedule of Work: provide and review project schedule
    - .1 Section 01 32 16 - Construction Progress Schedules
  - .3 Project Submittals: Review initial submissions
  - .4 Building Permit: Review status
  - .5 Shop Drawing Submission Schedule: present and review full schedule. Discuss grouped submissions. Submit submittals.
    - .1 Section 01 33 00 - Submittal Procedures.
  - .6 Temporary facilities: Site signs, offices, storage sheds, utilities, fences in accordance with contract documents.
  - .7 Site security: in accordance with contract documents
  - .8 Office procedures
    - .1 Change notices
    - .2 Change Orders, Change Directives - mark-up percentages permitted, time extensions, overtime
    - .3 Shop Drawings – procedures

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

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- .4 Approvals required
- .5 Administrative requirements.
- .9 Owner provided products.
- .10 Record Drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .11 Maintenance Manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .12 Take-over Procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .13 Monthly progress claims, administrative procedures, photographs, hold backs.
- .14 Process of Appointment of inspection and testing agencies or firms.
- .15 Insurances, transcript of policies.

**1.11 PROGRESS MEETINGS OAC** .1  
**(Owner/ Architect/Contractor)**

During course of Work and schedule progress meetings bi-weekly at a time to be agreed upon by all team participants.

- .2 Owner, Tenant, Consultant, General Contractor and Major Subcontractors, Supervisors involved in the work are to be in attendance as a minimum.
- .3 Notify parties minimum five (5) days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within two (2) days after meeting.
- .5 Agenda to include the following:
  - .1 Previous Minutes - Review, approval of minutes of previous meeting.
  - .2 Construction Schedule
    - .1 Review progress since the last meeting.
    - .2 Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule.
    - .3 Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so.
    - .4 Review schedule for next period
    - .5 Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - .3 RFI (Request For Information) Schedule review
  - .4 Submittals Schedule review
  - .5 Review of Work, field observations, problems, conflicts.
  - .6 Maintenance of quality standards.
  - .7 Other business.

**1.12 PROJECT METING CRM** .1  
**(CHANGE REVIEW MEETING)**

During course of Work and schedule progress meetings bi-weekly to occur directly after the OAC Meeting.

- .2 Project Managers representing The Owner, Consultant, General

Contractor (and when requested, Major Subcontractors) involved in the work shall be in attendance. Where Subcontractors have no involvement with active changes, they shall not attend the meeting.

- .3 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 2 days after meeting.
- .4 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Progress on changes since last meeting.
  - .3 Change issuance or design activities impeding or potentially impeding construction schedule.
  - .4 Status of Pricing Submissions
  - .5 Pricing Review and Resolution
  - .6 New Business

#### 1.13 PROJECT CLOSEOUT MEETING

- .1 Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than thirty (30) days prior to the proposed date of Substantial Completion
  - .1 Conduct the conference to review requirements and responsibilities related to Project closeout
  - .2 Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work
  - .3 Agenda: Discuss items of significance that could affect or delay Project closeout, including the following
    - .1 Preparation of record documents
    - .2 Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance
    - .3 Submittal of written warranties
    - .4 Requirements for preparing operations and maintenance data
    - .5 Requirements for delivery of material samples, attic stock, and spare parts
    - .6 Requirements for demonstration and training
    - .7 Preparation of Contractor's punch list/deficiency list
    - .8 Procedures for processing Applications for Payment at Substantial Completion and for final payment
    - .9 Submittal procedures
    - .10 Owner's partial occupancy requirements
    - .11 Installation of Owner's furniture, fixtures, and equipment
    - .12 Responsibility for removing temporary facilities and controls
  - .4 Minutes: record and distribute meeting minutes

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PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL1.1 RELATED REQUIREMENTS .1 Section 01 33 00 - Submittals1.2 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal GANTT Chart Schedules for this project shall be created in either Primavera or MS Project.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by The Consultant to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.



- .3 Limit activity durations to maximum of approximately 30 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

#### 1.4 START DATE

- .1 The work shall be started within 10 days of written orders to commence the same and carried on to completion.

#### 1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Master Plan Schedule to Consultant within ten (10) working days of Award of Contract.
  - .1 Include all project major milestones for review by consultant and owner representative.
  - .2 Review at first OAC meeting.
  - .3 Incorporate comments received.
- .3 Submit complete Project Schedule to Consultant within ten (10) working days of receipt of reviewed Master Plan Schedule.
  - .1 Modify and update project schedule monthly and reissue prior to OAC meetings.

#### 1.6 MASTER PLAN

- .1 Develop Master Plan schedule for protect Specific requirements.
- .2 Include the following items as minimum requirements.
  - .1 Contract Award.
  - .2 Mobilization to site
  - .3 Construction commencement date
  - .4 Building permit received
  - .5 Start and finish for each Major trade
  - .6 Substantial performance
  - .7 Total Performance.
  - .8 Critical Delivery items.
- .3 Reviewed schedule will become the basis for the creation of the Project Schedule.

#### 1.7 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Contract Award.
  - .2 General Contractor Mobilization to site
  - .3 Construction commencement date
  - .4 Building Trades – Shop Drawings, Start and Finish for each

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and every trade, or part thereof, including but not limited to the following

- .1 Building Excavation
- .2 Building Backfill.
- .3 Foundation footings.
- .4 Foundation walls
- .5 Shear, Elevator and Stair walls
- .6 Slab on grade.
- .7 Loadbearing block walls
- .8 Precast concrete
- .9 Structural Steel.
- .10 Steel deck
- .11 Parapets
- .12 Roofing.
- .13 Elevator conveying devices
- .14 Air Barrier
- .15 Exterior insulation
- .16 Windows
- .17 Curtainwall
- .18 Glazing
- .19 Exterior Cladding
  - .1 Broken down by material type
- .20 Interior Partitions
  - .1 Concrete block
  - .2 Gypsum board
- .21 Doors, Frames and Screens
- .22 Hardware
- .23 Ceilings
- .24 Millwork
- .25 Floor finishes
- .26 Painting
- .27 Architecture (Walls, Floors and Ceiling).
- .28 Washroom Specialties
- .29 Construction Specialties
- .30 Mechanical
  - .1 Drainage and Domestic
  - .2 Storm
  - .3 Water Heating
  - .4 HVAC with milestones for
  - .5 Sprinkler.
  - .6 Controls and BAS
- .31 Electrical.
  - .1 Main power
  - .2 Panels and distribution
  - .3 Circuits and receptacles
  - .4 Phone and data
  - .5 Public Address
  - .6 Lighting
  - .7 Security
  - .8 Fire protection
  - .9 Controls and BAS
- .5 Civil Works
  - .1 Excavation

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- .2 Backfill.
- .3 Services
  - .1 Sanitary
  - .2 Storm
  - .3 Water
  - .4 Power
  - .5 Data and other
  - .6 Curbs
  - .7 surfacing
- .6 Landscape Works
  - .1 Excavation
  - .2 Backfill.
  - .3 Structures
  - .4 Fences
  - .5 Surfacing
    - .1 Sidewalks
    - .2 Play areas
    - .3 Trees and plantings
    - .4 Sod
    - .5 Seed
- .7 Building Management Manual
- .8 Testing and Commissioning
- .9 Demonstration and training
- .10 Substantial Performance
- .11 Total Performance.
- .12 Project Critical Path identified with specific Risk Items identified, including but not limited to
  - .1 Equipment supply, long delivery items.
  - .2 Owner supplied items.
  - .3 Specialty items.

#### 1.8 PROJECT SCHEDULE REPORTING

- .1 Update the Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Provide the consultant and owner a copy of the updated schedule in printed format and digital, (manipulateible .mpp) format with each progress draw.
- .3 Include as part of Project Schedule,
  - .1 Identifying Work status to date
  - .2 Comparing current progress to baseline
  - .3 Provide current forecasts
  - .4 Defining problem areas, anticipated delays and impact
  - .5 If off schedule, provide proposed mitigation.
- .4 The monthly issuance of an updated project schedule shall coincide with the issuance of the Contractor's application for payment and shall form part of the requirement for a Certificate of Payment being issued by the Consultant to the Owner. Failure to provide the schedule, may result in the delay of payment of an application.

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 01 32 16  
CONSTRUCTION PROGRESS  
SCHEDULE  
Page 5 of 5

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1.9 SCHEDULE RESPONSIBILITY .1

The Owner, and Consultant will use the schedule for budgeting, planning and coordinating activities.

.2

The schedule is the responsibility of the Contractor. Once the initial schedule is reviewed and approved by the consultant, the contractor will implement measures as required to maintain the schedule and or make up the slippage lost. The owner will not be responsible for the cost required in contractor or subcontractor overtime, expedited material etc. as a result of slippage in the schedule.

1.10 PROJECT MEETINGS

.1

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

PART 2 - PRODUCTS

2.1 NOT USED

.1

Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1

Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS
- .1 Division 1 – General Requirements
  - .2 Section 01 32 16.06 – Construction Progress Schedule
  - .3 Section 01 45 00 – Quality Control
  - .4 Section 01 77 00 – Closeout Submittals
  - .5 All Section and Divisions of the Work
- 1.2 DEFINITIONS
- .1 Action Submittals: Written and graphic information and physical samples that require Consultant's responsive action.
  - .2 Informational Submittals: Written and graphic information and physical samples that do not require Consultant's responsive action. Submittals may be rejected for not complying with requirements.
- 1.3 ACTION SUBMITTALS
- .1 Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Consultant and additional time for handling and reviewing submittals required by those corrections
    - .1 Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule
    - .2 Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first sixty (60) days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication
    - .3 Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule
      - .1 Submit revised submittal schedule to reflect changes in current status and timing for submittals
    - .4 Format: Arrange the following information in a tabular format
      - .1 Scheduled date for first submittal
      - .2 Specification Section number and title
      - .3 Submittal category: Action; Information
      - .4 Name of subcontractor
      - .5 Description of the Work covered
  - .2 Submission Log: Prepare a SUBMITTAL LOG for the project. Maintain, update and distribute an updated log with each regular construction meetings, throughout the course of the Work. Log shall include the following minimum requirements:
    - .1 Submission Number

- .1 Spec section, article number and submission reference (042113,2.2.2-01)
- .2 General Contractors date submitted to Consultant (date received by consultant)
- .3 Consultant Submitted to (Sub-consultant or prime)
- .4 Excepted return date (no less than fifteen (15) working days from submission date unless previously agreed to by all parties)
- .5 Actual return date
- .6 Status indicator (pending review, reviewed, revise as noted, revise and resubmit, not reviewed)

#### 1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

Consultant's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Consultant for Contractor's use in preparing submittals.

- .2 Coordination: Coordinate preparation and processing of submittals with performance of construction activities
  - .1 Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity
  - .2 Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule
  - .3 Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals
  - .4 Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination
    - .1 Consultant reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received

#### 1.5 PROCESSING TIME

- .1 Processing Time: Unless otherwise noted, allow time for submittal review, including time for re-submittals, as follows.
  - .1 Initial Review: Allow **fifteen (15) working** days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Consultant will advise Contractor when a submittal being processed must be delayed for coordination
  - .2 Re-submittal Review: Allow **fifteen (15) working** days for review of each re-submittal

#### 1.6 ADMINISTRATIVE

- .1 Time for review shall commence on Consultant's receipt of submittal
- .2 Submit to Consultants, submittals listed/schedule for review. Submit promptly and in orderly sequence to not cause delay in Work.
- .3 Failure to properly schedule all submissions and/or resubmissions shall not be considered for a modification to the Contract Price or

Time. No claim for extension by reason of such default will be considered. Contractor shall coordinate this requirement with all trades and supplier and the Submission and Construction Schedules.

- .4 Do not proceed with Work affected by submittal until review is complete.
- .5 Shop Drawing Units: - Present shop drawings, product data, samples and mock-ups in Metric Units or Imperial Units depending on units provided by Consultant. Shop drawings provided in units contrary to this **will** be returned to contractor un-reviewed for conversion to the appropriate units.
- .6 General Contractors Review of Shop Drawings: Review **all** submittals from all sub-trades and suppliers prior to submission to Consultants. This review **will be held** to have been a thorough review General Contractor and that all the necessary requirements have been determined, reviewed and coordinated with requirements of Work and Contract Documents.
  - .1 Submittals not stamped, signed, dated and identified as to specific project **will** be returned without being examined and considered rejected.
  - .2 If, in the express opinion of the Consultant, the submission has not been properly or thoroughly reviewed by the Contractor, the submission **will** be returned without being examined and considered rejected.
- .7 Options: Identify options (highlight, and provide action sticky) requiring selection by Consultant
- .8 Coordination: Coordinate preparation and processing of submittals with performance of construction activities
  - .1 Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity
  - .2 Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule
  - .3 Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals
  - .4 Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination
- .9 Verify that field measurements and affected adjacent Work are co-ordinated.
- .10 Electronic Submittals: **Required/Mandatory**. All submissions shall be provide in electronic PDF format, unless otherwise approved. Paper submissions are not permitted, and will be rejected.
- .11 Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for re-submittal without review

- .12 Submittals not required by the Contract Documents may not be reviewed. Notification will be provided that the submission is not required.
- .13 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .14 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.
- .15 The Consultant will review and return shop drawings and samples with reasonable promptness so as to avoid delay.
  - .1 This review by the Consultant, or any of its sub-consultants, of shop drawings, samples and data sheets pertains to general design only.
  - .2 Errors in dimensions, quantities or interference will be marked if noticed, but this will not relieve the Contractor in any way from his responsibilities for the proper fitting, finishing, quality, quantities, erection and coordination of the Work in accordance with the requirements of the Contract Documents.
  - .3 The Contractor shall be fully responsible in his review for errors on shop drawings and for furnishing materials and labour not specifically indicated or specified but required to properly complete the Work.
  - .4 Before preparation of shop drawings, or prior to fabrication, the Contractor shall confirm dimensions which can be correlated with job conditions
- .16 Separate submissions: Separate submissions by Consultant discipline and by specification section and provide separate submission cover for each item required.
- .17 Partial and preliminary submissions: Partial submissions and preliminary submissions should not be provided for the project, without the prior approval of the Consultant. If provided without approval they will be returned without action.
  - .1 Co-ordinate the preparation, submission, review, (re-submission and re-review) of all submittals with the Construction schedule.
- .18 Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Consultant on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal
- .19 Resubmittals: Make resubmittals in same form and number of copies as initial submittal
  - .1 Note date and content of previous submittal
  - .2 Note date and content of revision in label or title block and



- clearly indicate extent of revision
  - .3 Resubmit submittals until they are marked with approval notation from Consultant's action stamp
- .20 Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms
- .21 Submittals on Site:
  - .1 Print and maintain one full scale, colour copy of each reviewed submission on site.
  - .2 Use only final action submittals that are marked with approval notation from Consultant's stamp.
  - .3 Provide access to these files for use by the Consultant or Owner

## 1.7 DELIVERY INFORMATION

- .1 Prepare and issue submittals directly to consultant responsible for design of that portion of work, with a copy of every submission being provided to the Prime Consultants designee.
  - .1 Refer to Specification table of contents for reference to consultant responsible by section.
  - .2 Refer to contact information for consultants in spec section 00 21 13 Instruction to bidders article 1.9.
- .2 Transmittal: All copies of shop drawings shall include a round trip transmittal and stamping sheet.
  - .1 Indicate name of firm or entity that prepared each submittal on label or title block
  - .2 Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Consultant
  - .3 Include the following information for processing and recording action taken
    - .1 Project name
    - .2 Project Number (Architects project number)
    - .3 Date
    - .4 Submittal number or other unique identifier, including revision identifier
      - .1 Submittal number. Section and Article number dash submission number as (042113,2.2.2-01).
      - .2 Re-submittals shall revise the final submission number as follows (042113,2.2.2-02).
    - .5 Specification Section Number and Name
    - .6 Drawing number and detail reference number (as applicable)
    - .7 Name of Consultant
    - .8 Name of Subcontractor
    - .9 Name of Supplier
    - .10 Name of Manufacturer
    - .11 Submittal number or other unique identifier, including revision identifier

- .12 Other information as may be required or requested by the Consultant.

**1.8 SHOP DRAWINGS AND  
PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work. Proceeding with the work without approval for additional scope is the contractor's acceptance that they accept all cost associated with the supply and install as indicated on the shop drawings.
- .5 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .6 Submissions include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
- .1 Subcontractor.
- .2 Supplier.
- .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
- .1 Fabrication.
- .2 Layout, showing dimensions, including identified field dimensions, and clearances.
- .3 Setting or erection details.
- .4 Capacities.
- .5 Performance characteristics.
- .6 Standards.
- .7 Operating weight.
- .8 Wiring diagrams.
- .9 Single line and schematic diagrams.
- .10 Relationship to adjacent work.
- .7 After Consultant review, distribute copies.

- .8 Delete information not applicable to project.
- .9 Supplement standard information to provide details applicable to project.
- .10 The review of shop drawings by Consultant is for sole purpose of ascertaining conformance with general concept.
  - .1 This review shall not mean that The Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

#### 1.9 GROUP SUBMISSIONS

- .1 Within the first thirty (30) days of construction, coordinate with all required sub-trades and provide the following group submittals for review by the Consultant. These group submissions are required to review a number of project elements together to preserve the architectural design intent of the project. Provide all sample clearly labeled and identified. Group all materials into a single submission and submit to the consultant at least ninety (90) days before material is required to be ordered.
  - .1 Exterior Finish Group
    - .1 Exterior brick masonry (for each type).
      - .1 Manufacture literature
      - .2 Size and Colour
      - .3 Sample board
    - .2 Composite Metal Wall Panels
      - .1 Manufacturers literature
      - .2 300mm X 300mm corner sample with dry joint
      - .3 Specified colour samples
      - .4 Colour selection chart.
    - .3 Preformed Metal Siding
      - .1 Manufacturers literature
      - .2 300mm X 300mm sample of specified material
      - .3 Colour sample selection chart.
    - .4 Glazed Aluminum Curtain Wall framing
      - .1 Manufacturers literature
      - .2 Finish colour
      - .3 Sample of different specified trim caps
    - .5 Aluminum Window framing
      - .1 Manufacturers literature
      - .2 Finish colour
      - .3 Sample of different caps
    - .6 Glazing

- .1 Manufacturers literature
    - .2 Sample of each types of thermal unit in colour specified
    - .3 Sample of spandrel glazing in colour specified.
  - .7 Louvers and Vents
    - .1 Manufacturers literature
    - .2 300mm X 300mm Sample corner frame with louvers
    - .3 Colour selection chart.
  - .8 Other material used on the exterior of the building
    - .1 Manufacturers literature
    - .2 Colour selection samples.
- .2 Interior Finish Group
  - .1 Finish Carpentry - woodwork
    - .1 Manufacturers literature
    - .2 300x300 sample of finished casework in species of wood identified and finished to meet specification requirements.
      - .1 Range of finishes and stains where applicable.
  - .2 Finish Carpentry – plastic laminate
    - .1 Manufacturers litera
    - .2 Manufacturers sample ranges as specified in contract documents.
  - .3 Wood Doors.
    - .1 Manufacturers literature
    - .2 300x300 sample of finished wood door in species of wood identified and finished to meet specification requirements
      - .1 Range of finishes and stains where applicable.
  - .4 Flooring.
    - .1 Approved manufacturers literature
    - .2 Manufacturers colour range(s) of each flooring type with specified surface texture and colour.
    - .3 Base, manufacturers colour range of each type of base, with specified colour, or colour sample range where no colour specified.
  - .5 Acoustic Panel Ceilings.
    - .1 Manufacturers literature
    - .2 Manufacturers colour range(s) of each type of ceiling specified.
    - .3 Sample of ceiling suspension system(s).
  - .6 Folding Panel Partitions/Operable Walls.
    - .1 Manufacturers literature
    - .2 Manufacturers colour range of wall covering with specified surface texture and colour, or colour sample range where no colour specified.
  - .7 Toilet Compartments.
    - .1 Manufacturers literature

- .2 Colour selection sample range.
- .8 Lockers.
  - .1 Manufacturers literature
  - .2 Colour selection sample range.
- .9 Elevators and Lifts.
  - .1 Manufacturers literature
  - .2 Colour selection chart and sample range for all wall ceiling and floor finishes where applicable.

#### 1.10 OPERATION AND MAINTENANCE MANUALS

- .1 Operation and Maintenance Manual Master List: **Sixty (60)** working days prior to substantial performance, the contractor shall review the Contract Documents (specification, schedules, and drawings) and assemble a master list of all materials to be included in the Operation and Maintenance Manual, necessary and required for the project.
  - .1 Organize list to match the format of final submission,
  - .2 Submit this list to the Consultant for review.
- .2 Coordinate the assembly of all manuals from all trades and sub-trades, to match this master format developed for the project. Review all submissions from trades and sub-trades for compliance prior to submission to the Consultant.
- .3 Warranty and Guaranty: All Warranty and Guarantees periods shall commence on the date of Substantial Performance of the Project. Coordinate this requirement with all sub-trades and suppliers. Review submissions from trades, sub-trades and suppliers to ensure conformance. Do not submit Operation and Maintenance manuals until all are in conformance with this requirement.
- .4 Submit two (2) Hard and two (2) Electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
- .5 Manuals to contain operational information on equipment, cleaning and lubrication schedules, filters, overhaul and adjustment schedules and similar maintenance information. Instructions in this manual shall be in simple language so as to guide the Owner in the proper operation and maintenance of building components. In all cases where a manufacturer's data sheets, instruction and/or maintenance manuals are available in bilingual form they shall be so included in the submission.
- .6 Bind contents in a three-ring, hard covered, plastic jacketed binder. Organize contents into applicable categories of work, parallel to specifications Sections.
- .7 In addition to information specified, include the following:
  - .1 Title sheet, labeled "Operating and Maintenance instructions", containing project name and date
  - .2 List of names, addresses and phone numbers of subcontractors and suppliers who can effect repair or maintenance on equipment
  - .3 List of contents

- .4 Maintenance instructions for finished surface and materials
  - .5 Copy of hardware and paint schedules
  - .6 Description, operation and maintenance instructions for equipment and systems, including complete lists of equipment and parts list. Indicate nameplate information such as make, size, capacity, serial numbers
  - .7 Names, addresses and phone number of sub-contractors and suppliers
  - .8 Guarantees, warranties and bonds
  - .9 Additional material used in project listed under various Sections showing name of manufacturer and source of supply
- .8 Include one complete set of final reviewed shop drawings, bound separately, indicating any changes made during fabrication and installation.

#### 1.11 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to a location as agreed to by the Consultant and Owner, noting this location may be in Sault Ste Marie or Sudbury.
- .3 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work. Proceeding with the work without approval for additional scope is the contractor's acceptance that they accept all cost associated with the supply and install.
- .5 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

#### 1.12 DELEGATED DESIGN SERVICES

- .1 Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated
  - .1 If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Consultant
- .2 Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit five paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically

assigned to Contractor to be designed or certified by a design professional

- .1 Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services

### 1.13 MOCK-UPS

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control and each applicable specification section.

### 1.14 PHOTOGRAPHIC DOCUMENTATION

- .1 Provide construction progress during the course of construction. Photographs shall start at time of contract award and end at time of issuance of certificate of deemed completion.
- .2 Provide minimum 15 pictures per month.
- .3 Submit one set of electronic copy of colour digital photography in JPG format, fine resolution with the monthly progress statement.
- .4 Take Photographs of specific areas of interest on the construction site.
- .5 Monthly application for payment will deem to be incomplete without the progress photo submission.

### 1.15 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit WSIB Clearance.
- .2 Submit transcription of insurance immediately after award of Contract.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not Used.

END OF SECTION

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 01 34 00  
SUBSTITUTION OR  
ALTERNATE, PROCEDURES  
Page 1 of 6

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**PART 1 - GENERAL**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section
- .2 Section includes administrative and procedural requirements for substitutions that may be required post tender.
- .3 Substitutions or alternates should all be pre-approved prior to close of tender. However certain conditions, may arise that necessitate the need of a substitution or alternate. These specific conditions are outline below.
- .4 Requests for alternates or substitutions submitted with shop drawing submissions will not be considered.

**1.2 RELATED REQUIREMENTS**

- .1 Division 1 – General Requirements
- .2 Section 01 61 00 – Common Product Requirements
- .3 All Section and Divisions of the Work

**1.3 ACCEPTABLE PRODUCTS**

- .1 First item named or specified by catalogue number meets specifications in all respects regarding performance, quality of material and workmanship, and is acceptable to the Architect
- .2 Items, other than first named, meeting specifications regarding quality of materials and workmanship only, are acceptable to the Architect, if they also meet performance, match the first named product in colour and texture, etc. and/or capacities specified and can be accommodated within the space allotted
- .3 General approval indicated by inclusion of other manufacturers named is subject to final review of submitted samples of shop drawings, performance data and test reports
- .4 Where the contractor uses equivalent products other than that first named, on which design is based, the contractor shall be fully responsible for all details of installation including product size, arrangement, fit, colour, etc. and maintenance of all required clearances.

**1.4 DEFINITIONS**

- .1 Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor
  - .1 Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as, regulatory changes, or other reason as approved by the consultant.
  - .2 Substitutions for Owner Benefit: Changes proposed by Contractor that will provide superior performance, or provide the Owner with some other benefit, to materials/items



specified.

- .1 Provide with proposal, a full description of the specified material and the proposed substitution with a comparison or the two items and a description/outline of the Owner Benefit.
- .3 Substitutions for Contractor Benefit or Convenience: Changes proposed by Contractor that are not required in order to meet the Project requirements.
  - .1 Will not be permitted
- .2 "Or-Equal"
  - .1 Where the phrase "or equal", "approved equal", or "equal as approved by the Architect(consultant)" occurs in the Contract Documents, do not assume that materials, equipment, or methods will be approved by the Architect.
  - .2 The decision of the Consultant shall be final.

**1.5 AVAILABILITY OF SPECIFIED ITEMS**

Verify, prior tender close, that all specified items are or will be available in time for installation on the project.

- .1 Coordinate all aspects, with suppliers and trades for ordering material and obtain shop drawing review with the project schedule.
- .2 In the event specified items are not, or will not be so available, notify the Architect prior to tender close.
  - .1 Submit one request for substitution for each item for Consultant review.
  - .2 Submit with cover document including the following information:
    - .1 Project Name
    - .2 Project Number
    - .3 Item Name
    - .4 Specification and/or Drawing Reference including article and sub-article reference
    - .5 Manufacturer/supplier name, address and contact information.
  - .3 Proposed alternate with all relevant data for comparison to specified product.
  - .4 Submit no later than four (4) working days prior to tender close, for evaluation by the Consultant.
- .3 Changes to Contract Price or Contract Time, because of non-availability of specified items, will not be borne by the Owner
- .4 Additional time required by the consultant team to review additional submissions may back-charged to the contractor, and shall not be borne by the Owner

**1.6 SUBSTITUTION FOR CAUSE**

.1 Submit requests for substitution immediately on discovery of need for change. Submit with ample time to allow for full review and possible rejection of submittal so as to not affect the construction schedule.

- .2 Submit each request for consideration separately, do not group submissions
- .3 Include with the submission the following minimum requirements..
  - .1 Provide cover sheet or Contractors Requested for Alternate (RFA) form and indicate the following:
    - .1 Project Name
    - .2 Project Date
    - .3 Specification section and article number.
    - .4 Drawing reference where applicable.
  - .2 Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
  - .3 Product Data, including drawings and descriptions of products and fabrication and installation procedures
  - .4 Detailed comparison, chart and/or table, of proposed substitution to item/Work specified. Include all relevant data and material test data for comparison. Indicate all deviations from the Work specified
  - .5 Samples, where applicable or requested
  - .6 Certificates and qualification data, where applicable or requested
  - .7 List of similar installations for completed projects with project names and reference contacts
  - .8 Research reports evidencing compliance with building code in effect for Project
  - .9 Authorities: Include a statement indicating that the requested substitution has received necessary approvals of authorities having jurisdiction
  - .10 Warranty: Include a statement that the requested substitution provides specified warranty
  - .11 Schedule Impact: Include a statement that proposed alternate will not extend the construction schedule.
  - .12 Cost Impact: Include a statement that the proposed change shall not impact the contract price
  - .13 General Contractor's Certification: Include a statement that they have reviewed proposed substitution and it complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related and adjacent materials, and is appropriate for application indicated.
  - .14 General Contractor's Waiver: Include a waiver of rights to any additional costs or time that may subsequently become necessary because of coordination (or lack thereof) or failure of proposed substitution to produce indicated results.
- .4 Additional Information: If necessary, the Consultant may request additional information or documentation for evaluation within **seven (7)** working days of receipt of a request for substitution. Provide requested information as soon as possible, to assist in the review process.
- .5 Evaluation period: Submit requisitions allowing ample time for review process, coordinate with construction schedule. Allow for a

minimum of **fifteen (15)** working days following Consultants receipt of all information.

- .6 Acceptance or Rejection:
  - .1 Acceptance: If approved, the Consultant will issues formal paperwork to document the approval, with accepted contract forms.
  - .2 Rejection: If rejected, the consultant will issue instruction to the contractor of the rejection.
    - .1 The Consultant may not, nor is required to, provide reasons for rejection.
    - .2 Appeals to rejected items will not be permitted.

#### 1.7 SUBSTITUTION FOR OWNER BENEFIT

Submit requests for substitution immediately on discovery of need for change. Submit with ample time to allow for full review and possible rejection of submittal so as to not affect the construction schedule.

- .2 Conditions: Consultant will consider Contractor's request for substitution only when all of the following conditions are satisfied. If the following conditions are not satisfied, Consultant will return requests without action, except to record noncompliance with these requirements
  - .1 Provide cover sheet or Contractors Requested for Alternate (RFA) form and indicate the following:
    - .1 Project Name
    - .2 Project Date
    - .3 Specification section and article number.
    - .4 Drawing reference where applicable.
  - .2 Detailed comparison, chart and/or table, of proposed substitution to item/Work specified. Include all relevant data for comparison. Indicate all deviations from the Work specified
  - .3 Authorities: Include a statement indicating that the requested substitution has received necessary approvals of authorities having jurisdiction
  - .4 Warranty: Include a statement that the requested substitution provides specified warranty
  - .5 Schedule Impact: Include a statement that proposed alternate will not extend the construction schedule.
  - .6 Cost Impact: Provide a fixed fee quotation for the credit to the contract price that the proposed change will provide.
  - .7 General Contractor's Certification: Include a statement that they have reviewed proposed substitution and it complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related and adjacent materials, and is appropriate for application indicated.
  - .8 General Contractor's Waiver: Include a waiver of rights to any additional costs or time that may subsequently become necessary because of coordination (or lack thereof) or failure of proposed substitution to produce indicated results.

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- .3 Additional Information: If necessary, the Consultant may request additional information or documentation for evaluation within **seven (7)** working days of receipt of a request for substitution. Provide requested information as soon as possible, to assist in the review process.
  - .4 Evaluation period: Submit requisitions allowing ample time for review process, coordinate with construction schedule. Allow for a minimum of **fifteen (15)** working days following Consultants receipt of all information.
  - .5 Acceptance or Rejection:
    - .1 Acceptance: If approved, the Consultant will issues formal paperwork to document the approval, with accepted contract forms
    - .2 If accepted the Consultant is under no obligation to provide revised design documents depicting said change.
    - .3 Upon acceptance, and only after acceptance, submit project specific shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
    - .4 Rejection: If rejected, the consultant will issue instruction to the contractor of the rejection.
      - .1 The Consultant may not, nor is required to, provide reasons for rejection.
      - .2 Appeals to rejected items will not be permitted.
- 
- 1.8 SUBSTITUTION FOR CONVIENEINCE .1 Will not be considered.
- 
- 1.9 QUALITY ASSURANCE .1 Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers. .
- 
- 1.10 PROCEDURES .1 Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions
- 
- PART 2 - PRODUCTS
- 
- 2.1 SUBSTITUTIONS .1
- 
- PART 3 - EXECUTION
- 
- 3.1 NOT USED .1 Not Used.

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END OF SECTION

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## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Ontario
  - .1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2005.

### 1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within ten (10) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .1 Results of site specific safety hazard assessment.
  - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
- .3 Submit One (1) copy of Contractor's authorized representative's work site health and safety inspection reports to Consultant Weekly.
- .4 Submit one (1) copy of each health and safety meeting minutes to Consultant.
- .5 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .6 Submit copies of incident and accident reports.

### 1.3 FILING OF NOTICE

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

### 1.4 SAFETY ASSESSMENT

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

### 1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with All Trades prior to commencement of Work.

### 1.6 REGULATORY REQUIREMENTS

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

### 1.7 GENERAL REQUIREMENTS

- .1 Develop site-specific Health and Safety Plan based on hazard

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assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

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

### 1.8 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

### 1.9 UNFORSEEN HAZARDS

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

### 1.10 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety coordinator. Health and Safety coordinator must:
  - .1 Have site-related working experience specific to activities associated with this type and scale of construction.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 The authorized representative shall be on site when construction activities are ongoing
  - .6 The authorized representative shall not be employed in any other capacity except to discharge this duty (ie: cannot be a site superintendent, project manager, work coordinator, labourer etc...)

### 1.11 POSTING OF DOCUMENTS

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

### 1.12 CORRECTION OF NON-COMPLIANCE

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

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- .2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 BLASTING

- .1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Consultant.

1.14 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Consultant.

1.15 WORK STOPPAGE

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

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION



**PART 1 - GENERAL****1.1 INSPECTION**

- .1 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant's instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, The Owner shall pay cost of examination and replacement.

**1.2 STANDARDS**

- .1 Where initials of an organization are used, followed by number or combination of numerals and letters, this designates a standard produced by the organization. Conform to issue of standard so designated, as amended and revised to date of contract. When designation does not indicate particular edition of standard edition current at date of Contract shall apply.
  - .1 Contractor shall provide a copy of all standards indicated or required for the project in the Construction trailer and will provide copies to the consultant upon request.
- .2 Wherever a standard confers upon a person, a body politic or a body corporate the right to approve, to select, to exercise authority or to interpret the standard, and refers to that person, body politic or body corporate as the Authority having jurisdiction, the Authority, the Engineer, the Department, the Purchaser, the Contracting Officer or by some other such designation, the Architect shall have the right to exercise the powers of any such person, body politic, or body corporate.
- .3 Where standards and manufacturer's instructions reduce the requirements of the Contract Documents, the Contract Documents shall govern.
- .4 Where standards and manufacturer's instructions are in excess of the requirements of the Contract Documents, the Standards and manufacturers instruction shall govern.

**PART 2 - PRODUCTS****2.1 NOT USED**

- .1 Not Used.

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PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.  
END OF SECTION

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PART 1 - GENERAL

1.1 ACTION AND  
INFORMATIONAL SUBMITTALS

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

1.2 INSTALLATION AND  
REMOVAL

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

1.3 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 WATER SUPPLY

- .1 Owner will provide continuous supply of potable water for construction use
- .2 Make temporary connections and distribution piping as may be required for construction. Ensure all temporary connections do not negatively impact on going operations in adjacent spaces.
- .3 Disconnect and restore temporary water service connections provided by this Contractor that are beyond those noted in the Janitor closets, return these temporary connections to condition as found pre contract.

1.5 VENTILATION

- .1 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapors or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .2 Maintain strict supervision of operation of ventilating equipment to:
  - .1 Conform with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .3 All interior spaces within the construction areas shall be maintained at a minimum temperature of 50 degrees Fahrenheit or as otherwise required by product manufacturers and installers.

- .4 Contractor must follow Owner Ventilation Shut Down Policy.

#### 1.6 TEMPORARY POWER AND LIGHT

- .1 Connection to existing electrical services can be made as long as there is no reduction in the existing service and its characteristic that will adversely affect the operation of the existing building during or after use of such electrical power. Power can be used for temporary lighting and operating of power tools inside of the building, to a maximum supply of 208 volts. If power connection is made to existing services at building, it is expected that power consumption and costs will be normal and will not be abused. If extraordinary costs will be experienced resulting from construction activity, obtain approval prior to consuming. If extraordinary utility bills are not preapproved they will be charged back to the contractor.
- .2 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.
- .3 Arrange for connection with Owner where impacting existing distribution. Pay all costs for installation, maintenance and removal.
- .4 Provide and maintain temporary lighting throughout all areas of the construction zone.
- .5 Maximum power supply at 120/208 V, 3 phase, 60 Hz is available and will be provided for construction use at cost. Connect to existing power supply in accordance with Canadian Electrical Code and provide additional circuit breakers in existing panels or distribution units/switches to suit requirements.

#### 1.7 TEMPORARY COMMUNICATION FACILITIES

- .1 Provide and pay for temporary telephone, data, and equipment necessary for own use.

#### 1.8 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws. Turn over safe site to Owner in accordance with Ontario Health and Safety Requirements.
- .2 Prior to any interruption or shut down of the existing or new fire alarm and voice communication systems, the Contractor shall provide notification to the Fire Department, Owner, and Supervisory Staff and post notification for the Building Occupants.
- .3 For the duration of construction, the Contractor shall maintain a Fire Safety Watch to all areas where the fire alarm service is compromised or not operational, for all hours of the day until the new or modified Fire Alarm system for that area is installed and re-verified and operational. Provide hourly "24 hours" fire watch, review procedure with consultant, owner and Fire Department'
- .1 Fire watch inspections, shall include a visible inspection of all areas at least every hour, and documented records of the inspections, in a typical log to be provided by the Owner.
- .2 Fire watch personnel shall be equipped with a Cellular phone and provided with the appropriate emergency contact numbers.

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- .1 Review a list of emergency contacts and procedures with the Owner.
- .3 Before the construction forces depart for the day, an inspection shall be conducted of all areas of the construction zone for potential fire hazards or flammable vapors or liquids and made safe. Any potential hazards shall be documented for the subsequent fire watch
- .4 The Contractor may employ a designated supervisor from among their own forces, actively on the site, responsible for the activities above.
- .5 Any modifications to the above noted procedures must be approved by the Owner and Fire Department.
- .6 Burning rubbish and construction waste materials is not permitted on site.
- .7 Contractor must follow HSCDSB Hot Work Policy.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Not Applicable.

END OF SECTION

**PART 1 - GENERAL**

- 1.1 RELATED REQUIREMENTS** .1 Section 013119 – Project Management and Coordination.
- 1.2 REFERENCES** .1 Canadian General Standards Board (CGSB)  
.1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.  
.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.  
.2 Canadian Standards Association (CSA International)  
.1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.  
.2 CSA-0121-M1978(R2003), Douglas Fir Plywood.  
.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.  
.4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.  
.3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS** .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- 1.4 INSTALLATION AND REMOVAL** .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.  
.2 Indicate use of supplemental or other staging area.  
.3 Provide construction facilities in order to execute work expeditiously.  
.4 Remove from site all such work after use.
- 1.5 SCAFFOLDING** .1 Scaffolding in accordance with CAN/CSA-S269.2.  
.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs as required for all stages of construction.
- 1.6 ELEVATORS** .1 Use of permanent elevators shall be prohibited for construction activities
- 1.7 SITE STORAGE/LOADING** .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

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

#### 1.8 CONSTRUCTION PARKING

- .1 Parking will be permitted on site in designated contractor parking areas.
- .2 Provide and maintain adequate access to project site.

#### 1.9 SECURITY

- .1 Provide adequate security services, as deemed necessary by this contractor for protection of the building and all materials on site.
- .2 Owner shall not be liable for any theft, vandalism or other malicious acts on the property prior to substantial completion.

#### 1.10 OFFICES

- .1 General Contractor and Subcontractors to provide their own offices as necessary. Location of these offices to be determined on site with the Owner and may make use of the existing building.
  - .1 Meeting room. Consultant shall provide the meeting room for use in Contractor, Owner and Consultant team meetings for the duration of the project,.
- .2 Contractor to provide cleaning services to any space within existing facilities used as offices once every two days.
- .3 Contractor shall provide, maintain and service any trailers until Total Performance is achieved, or until such time as agreed upon by the Consultant. Include all cost in the Contract.

#### 1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

#### 1.12 SANITARY FACILITIES

- .1 Contractor may make use of existing sanitary facilities for work force. Should cleanliness become an issue, the Owner will revoke this access.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

#### 1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades,

placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

- .3 Protect travelling public from damage to person and property.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .6 Construct access and haul roads necessary.
- .7 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .8 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .9 Dust control: adequate to ensure safe operation at all times.
- .10 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Consultant.
- .11 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .12 Provide snow removal during period of Work.
- .13 Remove, upon completion of work, haul roads designated by Consultant.

#### 1.14 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

#### PART 2 - PRODUCTS

##### 2.1 NOT USED

- .1 Not Used.

#### PART 3 - EXECUTION

##### 3.1 NOT USED

- .1 Not Used.



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TEMPORARY BARRIERS AND  
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## PART 1 - GENERAL

- |  |    |  |
|--|----|--|
| <u>1.1 RELATED SECTIONS</u>                            | .1 | Work of all sections.  |
| <u>1.2 REFERENCES</u>                                  | .1 | Canadian General Standards Board (CGSB)<br>.1 CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.<br>.2 CAN/CGSB 1.189-[00], Exterior Alkyd Primer for Wood.                        |
|  | .2 | Canadian Standards Association (CSA International)<br>.1 CSA-O121-[M1978(R2003)], Douglas Fir Plywood.   |
|  | .3 | Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004. |
| <u>1.3 INSTALLATION AND REMOVAL</u>                    | .1 | Provide temporary controls in order to execute Work expeditiously.   |
|  | .2 | Remove from site all such work after use.  |
| <u>1.4 DUST TIGHT SCREENS</u>                          | .1 | Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.                           |
|  | .2 | Maintain and relocate protection until such work is complete.  |
| <u>1.5 ACCESS TO SITE</u>                              | .1 | Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.   |
| <u>1.6 PUBLIC TRAFFIC FLOW</u>                         | .1 | Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.            |
| <u>1.7 FIRE ROUTES</u>                                 | .1 | Maintain access to property including overhead clearances for use by emergency response vehicles.  |
| <u>1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY</u> | .1 | Protect surrounding private and public property from damage during performance of Work.  |
|  | .2 | Be responsible for damage incurred.  |
| <u>1.9 PROTECTION OF BUILDING FINISHES</u>             | .1 | Provide protection for finished and partially finished building finishes and equipment during performance of Work.   |

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.2 Provide necessary screens, covers, and hoardings.

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

1.10 WASTE MANAGEMENT AND DISPOSAL .1

Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

**END OF SECTION**

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COMMON PRODUCT  
REQUIREMENTS  
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## PART 1 - GENERAL

- |                                 |    |   |
|---------------------------------|----|---|
| <u>1.1 RELATED REQUIREMENTS</u> | .1 | Section 014500 – Quality Controls.  |
| <br>                            |    |   |
| <u>1.2 REFERENCES</u>           | .1 | Within text of each specifications section, reference may be made to reference standards.   |
|                                 | .2 | Conform to these reference standards, in whole or in part as specifically requested in specifications.  |
|                                 | .3 | If there is question as to whether products or systems are in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.  |
|                                 | .4 | Cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.   |
| <br>                            |    |   |
| <u>1.3 QUALITY</u>              | .1 | Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.  |
|                                 | .2 | Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work. |
|                                 | .3 | Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.                         |
|                                 | .4 | Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.  |
|                                 | .5 | Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.   |
|                                 | .6 | Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.   |
| <br>                            |    |   |
| <u>1.4 AVAILABILITY</u>         | .1 | Immediately upon signing Contract, review product delivery  |

requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

- .2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

### 1.5 MATERIALS

- .1 Review all material delivered to the site for conformance with the Contract Documents.
  - .1 Reject material that does not conform to the contract documents.
  - .2 Requests for approval of alternates will be rejected.
  - .3 Remove from the Place of the Work
- .2 Reject material damaged in transit to the site prior to installation into the Work.
  - .1 Remove from site and replace damaged materials
- .3 Store packaged materials in original undamaged containers with manufacturer's labels and seals intact.
- .4 Handle and store materials in accordance with manufacturers' and suppliers' recommendations.
- .5 Prevent damage.

### 1.6 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementations products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and doors on flat, solid supports and keep clear of ground.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags

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and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

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

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

#### 1.7 TRANSPORTATION

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

.2 Transportation cost of products supplied by Owner will be paid for by Owner. Unload, handle and store such products and install as noted in the contract documents.

#### 1.8 MANUFACTURER'S INSTRUCTIONS

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

.2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.

#### 1.9 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless, at his discretion.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

.4 Consultant reserves the right to request the certificate of qualification or apprenticeship of any worker on site.

.5 Consultant reserves the right to evaluate work trade ratios between apprentice and journeyman workers and dismiss apprentices or require the introduction of journeymen to ensure compliance with the Provincial requirements without the contractor having claim to any change in schedule or contract cost.

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**1.10 CO-ORDINATION**

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 General contractor to be the coordinator of the work of all trades.
- .3 General contractor will ensure that all trades have planned the work such that major conflict and removal is not required and that the co-ordination drawings have been completed and followed.
- .4 Be responsible for coordination and placement of openings, sleeves and accessories.

**1.11 CONCEALMENT**

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

**1.12 REMEDIAL WORK**

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

**1.13 LOCATION OF FIXTURES**

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

**1.14 FASTENINGS**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

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- 1.15 FASTENINGS - EQUIPMENT .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

- 1.16 PROTECTION OF WORK IN PROGRESS .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Consultant.
- .2 Employ the services of a Professional Engineer licensed in the Province of Ontario if there are areas deemed to potentially require the use of significant shoring or bracing to evaluate the area and provide a design to proceed.

- 1.17 EXISTING UTILITIES .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work and/or building occupants and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

END OF SECTION



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EXAMINATION

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PART 1 - GENERAL

- |  |    |  |
|--|----|--|
| <u>1.1 RELATED REQUIREMENTS</u>                | .1 | Section 014500 – Quality Controls  |
|  | .2 | Section 016100 – Common Requirements   |
| <u>1.2 REFERENCES</u>                          | .1 | Not Applicable.  |
| <u>1.3 EXISTING SERVICES</u>                   | .1 | Before commencing work, establish location and extent of <b><u>ALL</u></b> service lines in area of Work and notify Consultant of findings.  |
| <u>1.4 RECORDS</u>                             | .1 | Maintain a complete, accurate log of control and survey work as it progresses.   |
| <u>1.5 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Submit name and address of Surveyor to Consultant.   |
|  | .2 | On request of Consultant, submit documentation to verify accuracy of field engineering work.   |
| <u>1.6 SUBSURFACE CONDITIONS</u>               | .1 | Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon. |
|  | .2 | After prompt investigation, should Consultant determine that conditions do differ materially; instructions will be issued for changes in Work as provided in Changes and Change Orders.                        |

PART 2 - PRODUCTS

- |                     |    |           |
|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

END OF SECTION

**PART 1 - GENERAL****1.1 ACTION AND  
INFORMATIONAL SUBMITTALS**

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

**1.2 MATERIALS**

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Changes that require a change in the contract price or time require the submission of a Change Request, which may or may not be accepted by the Consultant. Include a clear description of the request, breakdown of cost impacts, schedule impacts, reason for change etc...

**1.3 PREPARATION**

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

**1.4 EXECUTION**

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

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EXECUTION

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- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Remove samples of installed Work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .10 Restore work with new products in accordance with requirements of Contract Documents.
- .11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 - Firestopping, full thickness of the construction element.
- .13 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .14 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

**PART 1 - GENERAL****1.1 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.
- .3 Clear snow and ice from access to construction and buildings under construction, remove snow from site.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris at certified landfills. Keep a record of and provide waybills to consultant when requested.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

**1.2 FINAL CLEANING**

- .1 Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations
- .2 Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions

- .3 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .4 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .5 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .6 Remove waste products and debris including that caused by Owner or other Contractors.
- .7 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.
- .8 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .9 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .10 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls.
- .11 Clean lighting reflectors, lenses, and other lighting surfaces.
- .12 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .13 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .14 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .15 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .16 Remove dirt and other disfiguration from exterior surfaces.
- .17 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .18 Sweep and wash clean paved areas.
- .19 Clean equipment and fixtures to sanitary condition; replace filters of mechanical equipment.
- .20 Clean roofs, downspouts, and drainage systems.
- .21 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

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.22 Remove snow and ice from access to building.

1.3 WASTE MANAGEMENT AND DISPOSAL .1

Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

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### PART 1 - GENERAL

#### 1.1 INTENT

- .1 Demolition of the size and scope of this project fall under the requirements of Ontario Regulation 102/94, Waste Audits and Waste Reduction Plans.
  - .1 Contractors are required to comply with all the requirements of the above noted regulation and provide all necessary and required documentation.
  - .2 Nothing contained within this specification, is meant to, nor shall reduce the requirements of this regulation.
- .2 This section is provided for information only. The contractor shall contact the governing Ministry of the Environment and obtain and comply with all the necessary and relevant regulations pertaining to the project and the demolition and disposal of construction waste.
  - .1 Obtain and use the latest accepted forms from the Ministry Representative.
- .3 All submittals shall be submitted in triplicate to the following:
  - .1 Ministry of Environment district representative.
  - .2 Owners Representative
  - .3 Consultant.

#### 1.2 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting to review and discuss The Waste Management Plan and Goals, consistent with the requirements
  - .1 Notify and coordinate representation at this meeting by the following
    - .1 Ministry of the Environment.
    - .2 Owner Representative
    - .3 Consultant
    - .4 Demolition Contractor
    - .5 Abatement Contractor.
    - .6 Disposal site representative.
- .2 Accomplish maximum control of solid construction waste.
- .3 Preserve environment and prevent pollution and environment damage.

#### 1.3 REFERENCES

- .1 Ontario Regulation 102/94 – Waste Audits and Waste Reduction Work Plans. (available from <https://www.ontario.ca/laws/regulation/940102>)
- .2 CCA 27-1997 – A Guide on Construction Environmental Management Planning (available from <http://cca-acc.com/en/industry-practices/cca-documents>)
- .3 CCA 81-2001 – A Best Practices Guide to Solid Waste Reduction (available from

<http://cca-acc.com/en/industry-practices/cca-documents>)

#### 1.4 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
- .3 Demolition Waste Audit (DWA): relates to actual waste generated from project.
- .4 Inert Fill: inert waste - exclusively asphalt and concrete.
- .5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
  - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
  - .2 Returning reusable items including pallets or unused products to vendors.
- .10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into individual types.
- .12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.



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- .14 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

### 1.5 DOCUMENTS

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

### 1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:
  - .1 Submit 2 copies of completed Waste Audit (WA): Schedule A.
  - .2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
  - .3 Submit 2 copies of completed Demolition Waste Audit (DWA): Schedule C.
  - .4 Submit 2 copies of Cost/Revenue Analysis Workplan (CRAW): Schedule D.
  - .5 Submit 2 copies of Materials Source Separation Program (MSSP) description.
- .3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
  - .1 Failure to submit could result in hold back of payment.
  - .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled or disposed of.
  - .3 For each material reused, sold or recycled from project, include amount and the destination.
  - .4 For each material land filled or incinerated from project, include amount of material and identity of landfill, incinerator or transfer station.

### 1.7 WASTE AUDIT (WA)

- .1 Conduct WA prior to project start-up.
- .2 Prepare WA: Schedule A.
- .3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

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### 1.8 WASTE REDUCTION WORKPLAN (WRW)

- .1 Prepare WRW prior to project start-up.
- .2 WRW should include but not limited to:
  - .1 Destination of materials listed.
  - .2 Deconstruction/disassembly techniques and sequencing.
  - .3 Schedule for deconstruction/disassembly.
  - .4 Location.
  - .5 Security.
  - .6 Protection.
  - .7 Clear labelling of storage areas.
  - .8 Details on materials handling and removal procedures.
  - .9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.
- .3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
- .4 Describe management of waste.
- .5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.
- .6 Post WRW or summary where workers at site are able to review content.
- .7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.
- .8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

### 1.9 DEMOLITION WASTE AUDIT (DWA)

- .1 Prepare DWA prior to project start-up.
- .2 Complete DWA: Schedule C.
- .3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

### 1.10 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

- .1 Prepare CRAW: Schedule D.

### 1.11 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

- .1 Prepare MSSP and have ready for use prior to project start-up.
- .2 Implement MSSP for waste generated on project in compliance with approved methods.
- .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

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- .4 Provide containers to deposit reusable and recyclable materials.
- .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .6 Locate separated materials in areas which minimize material damage.
- .7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
  - .1 Transport to approved and authorized recycling facility or to users of material for recycling.
- .8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.
  - .1 Ship materials to site operating under Certificate of Approval.
  - .2 Materials must be immediately separated into required categories for reuse or recycling.

1.12 WASTE PROCESSING  
SITES

- .1 Province of Ontario Locate and utilize approved and registered landfill sites that are proximal to the demolition/construction sites.

1.13 STORAGE, HANDLING AND  
PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by the Owner.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed for demolition from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Consultant.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Separate and store materials produced during dismantling of structures in designated areas.
- .9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
  - .1 On-site source separation is recommended.
  - .2 Remove co-mingled materials to off-site processing facility for separation.

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.3 Provide waybills for separated materials.

#### 1.14 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
  - .1 Number and size of bins.
  - .2 Waste type of each bin.
  - .3 Total tonnage generated.
  - .4 Tonnage reused or recycled.
  - .5 Reused or recycled waste destination.
- .4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

#### 1.15 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Maintain security measures established by existing facility, provide temporary security measures approved by the Owner

#### 1.16 SCHEDULING

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

### PART 2 - PRODUCTS

#### 2.1 NOT USED

- .1 Not Used.

### PART 3 - EXECUTION

#### 3.1 APPLICATION

- .1 Do Work in compliance with WRW.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

#### 3.2 CLEANING

- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.

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

### 3.3 DIVERSION OF MATERIALS

.1 **Demolition Waste:**

Material Type	Recommended Diversion %	Actual Diversion %
Acoustic Tile	50	<input type="text"/>
Acoustical Insulation	100	<input type="text"/>
Carpet	100	<input type="text"/>
De-mountable Partitions	80	<input type="text"/>
Doors and Frames	100	<input type="text"/>
Electrical Equipment	80	<input type="text"/>
Furnishings	80	<input type="text"/>
Marble Base	100	<input type="text"/>
Mechanical Equipment	100	<input type="text"/>
Metals	100	<input type="text"/>
Rubble	100	<input type="text"/>
Wood (uncontaminated)	100	<input type="text"/>
Other		<input type="text"/>

.2 **Construction Waste:**

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	<input type="text"/>
Plastic Packaging	100	<input type="text"/>
Rubble	100	<input type="text"/>
Steel	100	<input type="text"/>
Wood (uncontaminated)	100	<input type="text"/>
Other		<input type="text"/>

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For the Huron-Superior Catholic District School Board  
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**3.4 WASTE AUDIT (WA)**

.1

**Schedule A - Waste Audit (WA):**

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

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3.5 WASTE REDUCTION  
WORKPLAN (WRW)

.1 Schedule B: Waste Reduction Workplan  
(WRW)

(1) Material  Category	(2) Person(s)  Responsible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual (5) Recycled Amount (unit) Projected	Actual (6) Material(s) Destination
Wood and Plastics Material Description Chutes Warped Pallet Forms Plastic Packaging Cardboard Packaging Other Doors and Windows Material Description Painted Frames Glass Wood Metal Other					

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3.6 DEMOLITION WASTE AUDIT .1  
(DWA)

**Schedule C - Demolition Waste Audit (DWA):**

(1) Material Description	(2) Quantity	(3) Unit	(4) Total	(5) Volume (cum)	(6) Weight (cum)	(7) Remarks and Assumption
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Wood  
Wood  
Stud  
Plywood  
Baseboard  
-Wood  
Door  
Trim -  
Wood  
Cabinet  
Doors  
and  
Windows  
Panel  
Regular  
Slab  
Regular  
Wood  
Laminate  
Byfold -  
Closet  
Glazing



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3.7 COST/REVENUE ANALYSIS  
WORKPLAN (CRAW)

.1 **Schedule D - Cost/Revenue Analysis**  
**Workplan (CRAW):**

(1) Material Description	(2) Total Quantity (unit)	(3) Volume (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit \$(+/-)	(6) Category Sub-Total \$(+/-)
Wood					
Wood Stud					
Plywood					
Baseboard					
- Wood					
Door Trim					
- Wood					
Cabinet					\$
Doors and					
Windows					
Panel					
Regular					
Slab					
Regular					
Wood					
Laminate					
Byfold -					
Closet					
Glazing					\$
		(7) Cost			\$
		(-) /			
		Revenue			
		(+)			

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### 3.8 CANADIAN GOVERNMENTAL .1 DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

#### Schedule E - Government Chief Responsibility for the Environment:

Province	Ontario
Address	Ministry of Environment and Energy 135 Clair Avenue West Toronto, Ontario M4V 1P5
General Inquires	416-323-4321
Fax	416-323-4682

END OF SECTION

**PART 1 - GENERAL**

- 1.1 RELATED REQUIREMENTS** .1 Division 1 – General Requirements  
.2 Section 01 29 00 - Payment Procedures  
.3 Section 01 31 19 – Project management and Coordination  
.4 Section 01 78 00 – Closeout Submittals
- 1.2 REFERENCES** .1 OAA/OGCA – General Take Over Procedures
- 1.3 SUMMARY** .1 Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following  
.1 Submittals  
.2 Pre-Substantial Performance Requirements  
.3 Substantial Completion procedures  
.4 Final Completion Procedures  
.5 List of Incomplete Items
- 1.4 SUBMITTALS** .1 Contractor's List of Incomplete Items: Initial submittal at Substantial Completion  
.2 Certified List of Incomplete Items: Final submittal at Final Completion  
.3 Certificates of Release: From authorities having jurisdiction
- 1.5 PRE-SUBSTANTIAL PERFORMANCE REQUIREMENTS** .1 Complete the following a minimum of ten (10) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request:  
.1 Advise Owner of pending insurance changeover requirements
- 1.6 SUBSTANTIAL COMPLETION PROCEDURE** .1 In general terms, (not to supersede the requirements of the Construction Act) the Contract is Substantially Performed when the following two conditions are achieved.  
.1 When the improvement to be made under the contract or a substantial part thereof is ready for use, or being used for its intended purpose.  
**AND**  
.2 When the improvement to be made under the contract is capable of completion or, where there is a known defect, correction, a cost of not more than,  
.1 3 per cent of the first \$1,000,000 of the Contract Price  
.2 2 per cent of the next \$1,000,000 of the Contract Price  
.3 1 per cent of the balance of the contract.

1.7 FINAL COMPLETION  
PROCEDURES

- .1 Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following
  - .1 Final Application for Payment according to Section 01 29 00 – Payment Procedures
  - .2 Certified List of Incomplete Items (Deficiency List): Submit certified copy of Consultant's Substantial Completion inspection list of items to be completed or corrected, endorsed and dated by Consultant. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
- .2 Inspection: Submit a written request for final inspection to determine acceptance a minimum of ten (10) days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Consultant will either proceed with inspection or notify Contractor of unfulfilled requirements.
- .3 If, upon inspection by the Consultant, it is determined that the work is not complete, the consultant will notify the Contractor of the outstanding Work and call for the work to be re-inspected once complete.
  - .1 The Consultant **shall** be entitled to compensation for subsequent re-inspection, and administrative costs. These will be billed to the owner as Additional Services. In turn, the Owner shall deduct these costs, plus a reasonable mark-up, from the Contractors payment applications.

1.8 LIST OF INCOMPLETE ITEMS  
(DEFICIENCY LIST)

- .1 Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1.9 REPAIR OF THE WORK

- .1 Complete repair and restoration operations before requesting inspection for determination of Substantial Completion
- .2 Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
  - .1 Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials
  - .2 Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration
    - .1 Do not paint over "ULC" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required

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- labels and identification
- .3 Replace parts subject to operating conditions during construction that may impede operation or reduce longevity
- .4 Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures

## PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

## PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

**PART 1 - GENERAL****1.1 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre Warranty Meeting:
  - .1 Convene meeting one (1) week prior to contract completion with All Contractor's Representatives, Consultant and Owner in accordance with Section 01 31 19 - Project Meetings to:
    - .1 Verify Project requirements.
    - .2 Review warranty requirements.
  - .2 Consultant to establish communication procedures for:
    - .1 Notifying construction warranty defects.
    - .2 Determine priorities for type of defects.
    - .3 Determine reasonable response time.
  - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
  - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Consultant two final copies of operating and maintenance manuals in English.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

**1.3 FORMAT**

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf [219 x 279] mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
  - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
  - .1 Bind in with text; fold larger drawings to size of text pages.

#### 1.4 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
  - .1 Date of submission; names.
  - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
  - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
  - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to Section 01 79 00 - Demonstration and Training.

#### 1.5 AS -BUILT DOCUMENTS

- .1 Maintain, in addition to requirements in General Conditions, at site for Consultant & Owner one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.
- .3 Keep record documents and samples available for inspection by Consultant.

#### 1.6 RECORDING INFORMATION ON PROJECT RECORD

- .1 Record information on set of black line opaque drawings.

DOCUMENTS

- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
  - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, and those required by individual specifications sections.

1.7 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
  - .1 Give function, normal operation characteristics and limiting conditions.
  - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
  - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
  - .2 Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.



- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control and 01 91 13 - General Commissioning (Cx) Requirements.
- .15 Aboveground storage tank inspection documentation, registration, forms, decommissioning and removal in accordance with CEPA SOR/2008-197.
- .16 Additional requirements: as specified in individual specification sections.

## 1.8 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
  - .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

## 1.9 MAINTENANCE MATERIALS

- .1 Spare Parts:
  - .1 Provide spare parts, in quantities specified in individual

- 
- specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Deliver to site; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Consultant
    - .2 Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
  - .2 Extra Stock Materials:
    - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  - .3 Special Tools:
    - .1 Provide special tools, in quantities specified in individual specification section.
  - 1.10 WARRANTIES AND BONDS .1 Assemble Warranty information in binder, submit upon acceptance of work and organize binder as follows:
    - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
    - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
    - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within [ten] days after completion of applicable item of work.
    - .4 Verify that documents are in proper form, contain full information, and are notarized.
    - .5 Co-execute submittals when required.
    - .6 Retain warranties and bonds until time specified for submittal.
  - .2 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
  - .3 Respond in timely manner to oral or written notification of required construction warranty repair work.
  - 1.11 NOT USED .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- .1 Section Includes.
  - .1 Methods and procedures for demolishing, salvaging, recycling and removing site work items designated to be removed in whole or in part.
- .2 Related Sections.
  - .1 Section 01 33 00 - Submittal Procedures.
  - .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
  - .3 Section 01 45 00 - Quality Control.
  - .4 Section 01 56 00 - Temporary Barriers-Enclosures
  - .5 Section 01 51 00 – Temporary Utilities

### 1.2 REFERENCES

- .1 Canadian Council of Ministers of the Environment (CCME).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .3 Transport Canada (TC).
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA), c. 34
- .4 Environmental Protection Act , Ontario Regulation 102/94 (EPAOR102/94) Waste Audits and Waste Reduction Work Plans.

### 1.3 DEFINITIONS

- .1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.
- .2 Waste Audit (WA): detailed inventory of materials in building. Indicates quantities of reuse, recycling and landfill.
  - .1 Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
  - .2 Indicates quantities of reuse, recycling and landfill.
- .3 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements. The contractor shall fulfill the requirements of the WMC.
- .4 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

### 1.4 SUBMITTALS

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

Procedures.

- .2 Shop drawings.
  - .1 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.
  - .2 Submit drawings stamped and signed by qualified professional engineer, in good standing, registered or licensed in Province in which the Work occurs.
- .3 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- .4 Waste Reduction Workplan: prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and indicate any and all requirements as mandated by the Regulation, and at least the following:
  - .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
  - .2 Schedule of selective demolition.
  - .3 Number and location of dumpsters.
  - .4 Anticipated frequency of tippage.
  - .5 Name and address of haulers and waste facilities.
- .5 Certificates: submit copies of certified weigh bills/bills of lading/receipts from authorized disposal sites and reuse and recycling facilities for material removed from site on monthly basis upon request of Consultant.
  - .1 Written authorization from Owner and Consultant is required to deviate from haulers or receiving organizations listed in Waste Reduction Workplan.

## 1.5 ENGINEERED DRAWINGS

- .1 Demolition Drawings
  - .1 Where required by authorities having jurisdiction, retain an Engineer, and submit for approval, any and all drawings, diagrams or details that may be required by the Authorities having Jurisdiction. Said drawings shall bear stamp and signature of qualified professional engineer, in good standing, registered in the Province of Ontario.

## 1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: ensure Work is performed in compliance with CEAA, TDGA, EPAOR102/94 and any other applicable Federal, Provincial and Municipal regulations.
- .2 Site Meetings.
  - .1 Convene Pre-Demolition Meeting prior to beginning work of this Section, coordinate meeting with the project schedule. The intent of this meeting is to:
    - .1 Verify project requirements.
    - .2 Review Waste Reduction requirements and

expectations.

- .3 Review existing installation and current conditions, develop work plan to suit new work required by Electrical and Owner fire alarm vendor sub-trades as indicated on the Drawings, which must be verified prior removal of existing fire alarm system within area of demolition work. Ensure all existing circuits within the demo zone are protected during demo activities occurring prior to removal to ensure no negative operational impacts, false alarms, troubles, etc. to adjacent occupied portion of building.
- .4 Co-ordination with other building sub-trades.
- .5 Co-ordinate with the owners continued use of the building.
- .6 Identify potential project risk items and develop solutions.
- .2 Coordinate and arrange attendance for this meeting with the following:
  - .1 General Contractor Project Manager
  - .2 General Contractor Superintendent
  - .3 Owners Representative
  - .4 Consultants Representative(s)
  - .5 Ministry of the Environment Representative
- .3 Waste management reporting.
  - .1 Reporting Requirements: The WMC shall complete all applications reporting and final verifications to the Ministry of the Environment as may be required. Copies of all correspondence shall be provided to the consultant and the owner for their records.
  - .2 WMC must provide written report on status of waste diversion activity at each meeting.
  - .3 Contractor will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.
- .4 Health and Safety. Unless otherwise specified, carry out demolition work in accordance with the Occupational Health and Safety Act, and Regulations for Construction Projects and applicable regulations as amended and revised to date of award of Contract including the regulation respecting asbestos made under O.H.S.A., Ontario Regulation 654/85 or latest edition

#### 1.7 DELIVERY, STORAGE AND HANDLING

- .1 Storage and Protection.
  - .1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Consultant and Owner at no cost to the Owner.
  - .2 Remove and store materials to be salvaged, in manner to prevent damage.
  - .3 Store and protect in accordance with requirements for maximum preservation of material.
  - .4 Handle salvaged materials as new materials.

- .2 Waste Management and Disposal.
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
  - .2 Separate for recycling and place in designated containers Steel, Metal, or Plastic waste in accordance with Waste Management Plan.
  - .3 Place materials defined as hazardous or toxic in designated containers.
  - .4 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
  - .5 Label location of salvaged material's storage areas and provide barriers and security devices.
  - .6 Ensure emptied containers are sealed and stored safely.
  - .7 Source separate for recycling materials that cannot be salvaged for reuse including wood, metal, concrete and asphalt, and gypsum.
  - .8 Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.

## 1.8 SITE CONDITIONS

- .1 Site Environmental Requirements.
  - .1 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
  - .2 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
    - .1 Ensure proper disposal procedures are maintained throughout the project.
  - .3 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
  - .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.
  - .5 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .2 Take over spaces to be demolished based on their condition on date that tender is accepted.
- .3 Inspect adjacent spaces and ensure that its condition and stability are recorded in a suitable manner for evaluation of possible damage caused by Work of this Section.
- .4 Photograph existing spaces in sufficient detail to record conditions and stability before work of this Section commences. These photographs will be used to compare to condition of adjacent construction before and after performance of work of this Section

should any damage to the adjacent construction occur. Submit all photographs to the Consultant prior to the commencement of any work.

### 1.9 SCHEDULING

- .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
  - .1 Notify Ministry and Consultant representative in writing should unforeseen delay(s) occur.
- .2 Coordinate with the Owner for phasing and hours of day for any and all demolition activities. The existing adjacent building will be occupied during the course of demolition and construction activities. Coordinate with the general contractor to maintain access thru and around the site as described in the Scope of The Work.
  - .1 Schedule any disruption to the existing college, or noisy operations closely with the Owner and Consultant representatives.
    - .1 Schedule work to be done after normal business hours and when the college is not in operation as required to meet the Owners needs

### 1.10 HAZARDOUS MATERIALS

- .1 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner, in designated disposal facilities, to minimize danger at site or during disposal
- .2 Remove contaminated or hazardous materials as defined by authorities having jurisdiction, and the reports as indicated below. Remove from site and dispose of, at designated disposal facilities, in safe manner and in accordance with authorities having jurisdiction

## PART 2 - PRODUCTS

### 2.1 EQUIPMENT

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- .1 Inspect site with Owner and Consultant and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Remove existing equipment, services and obstacles where required for refinishing or making good of existing surfaces, and replace same as work progresses.

- .4 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling.
- .5 Selling or burning materials on site is not permitted.

### 3.2 PROTECTION

- .1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, adjacent grades, parts of existing building to remain. Provide bracing, shoring and underpinning required. Make good damage and be liable for injury caused by demolition
- .2 Take precautions to support structures and, if safety of building being demolished or adjacent structures or services appears to be endangered, cease operations and notify the Consultant
- .3 Prevent debris from blocking surface drainage inlets and system and mechanical and electrical systems which must remain in operation
- .4 Barricade all access by unauthorized persons to areas in which demolition is in progress
- .5 Do not disrupt active or energized utilities traversing premises.
- .6 Access: Create controlled access to the demolition site and all demolition activities.
  - .1 Provide for safe, controlled access to and from demolition/construction areas within the site, for construction workers, material delivery and demolition waste removal.
  - .2 Provide for safe access around the demolition/construction areas within the site for use by the public.

### 3.3 REMOVAL OPERATIONS

- .1 Perform all demolition under direction of a foreman experienced in similar work at all time.
- .2 Remove items as indicated. Do not disturb items designated to remain in place. Confine demolition and associated work only to the area where demolition is required.
- .3 Water down debris as often as required to stop the spread of dust. Provide water connections and supply for this purpose.
  - .1 Control flow of demolition water to avoid storm and sanitary drainage systems.
  - .2 Where water is used inside the existing building, collect and pump and dispose of all demolition water off site. Temporarily block off all floor and storm drains, do not allow demolition water to down building drains.
- .4 Removal of Pavements, Curbs and Gutters:
  - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Consultant.
  - .2 Protect adjacent joints and load transfer devices.
  - .3 Protect underlying and adjacent granular materials.
- .5 Prevent contamination with base course aggregates, when removing



asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving,

.6 Salvage, from the facility the following items.

.1 None.

.2 Owner Item(s) to be salvaged: Other than the items as listed above, the owner will have salvaged what they wish to retain from the existing facility by the time of the Mandatory Site Meeting. The contractor shall assume the responsibility of the demolition and disposal of any remaining items, including furniture and the like, in the construction zone, unless otherwise directed.

.7 Disposal of Material.

.1 Dispose of materials not designated for salvage or reuse off site at authorized facilities.

### 3.4 STOCKPILING

.1 Do not stockpile demolished materials on site without the approval from the Owner and Consultant.

### 3.5 REMOVAL FROM SITE

.1 Transport material designated for alternate disposal using approved haulers, facilities, receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.

.1 Written authorization from Ministry Representative is required to deviate from haulers, facilities or receiving organizations listed in Waste Reduction Workplan.

.2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

.1 Disposal Facilities: approved and listed in Waste Reduction Workplan.

.2 Written authorization from Ministry Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

### 3.6 RESTORATION

.1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning the Work.

.2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

### 3.7 CLEANING

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.

.2 Remove debris daily as it accumulates.

.3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

---

**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 02 41 13  
SELECTIVE DEMOLITION  
Page 8 of 8

---

- .4 Clean: Prior to request for substantial performance, thoroughly clean the demolition zone.
  - .1 Blow down the dust from the structure.
  - .2 Broom clean, then vacuum clean the entire demolition zone

END OF SECTION

---

## Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 02 82 00  
HAZARDOUS MATERIAL  
ABATEMENT  
Page 1 of 1

---

### PART 1 - GENERAL

#### 1.1 HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT

- .1 Refer to the following Specification Section 02 82 01:  
Designated Substance and Hazardous Materials Survey  
Our Lady of Fatima Catholic School  
14 Strathcona Street, Chapleau, Ontario  
  
Dated  
May 12, 2022
- .2 This report is provided as is: The Consultant assumes no responsibility for any of its content, its completeness nor accuracy. Any questions regarding this report should be directed to the Owner.
- .3 Refer to Federal and Provincial regulations for definitions of Hazardous Materials.
- .4 Should suspect material be encountered on site that is not identified in the report or in case of discrepancies between this report and observations on site, advise the Owner in writing immediately and prior to proceeding with the work.
- .5 Comply with the latest requirements/procedures of any and all authorities having jurisdiction to provide the safe containment, removal and disposal of any Hazardous material.
- .6 The consultant nor any of their agents shall provide review of nor have authority over the abatement of any Hazardous Material.
- .7 Upon the completion of the removal of the Hazardous Material in the affected area(s). The contractor shall provide a letter/certificate from the authority having jurisdiction, indicating that the material has been removed and have been safely disposed of.
- .8 Provide abatement of all items identified as the affected construction zone.

### PART 2 - PRODUCTS

#### 2.1 NOT USED

- .1 Not used.

### PART 3 - EXECUTION

#### 3.1 NOT USED

- .1 Not used.

END OF SECTION



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May 12, 2022

Steve Brown  
Huron-Superior Catholic District School Board  
90 Ontario Avenue  
Sault Ste. Marie, ON  
P6B 6G7

**Project No: 22-0791**  
**Regarding: Designated Substance and Hazardous Materials Survey**  
**Our Lady of Fatima Catholic School, 14 Strathcona Street, Chapleau, Ontario**

Dear Steve Brown:

Please find enclosed the final version of TULLOCH's Report entitled "Designated Substance and Hazardous Materials Survey – Our Lady of Fatima Catholic School, 14 Strathcona Street, Chapleau, Ontario".

Should you have questions, concerns or wish to discuss, please contact the undersigned at your convenience.

Sincerely,

**TULLOCH Inc.**

Written By:

A handwritten signature in black ink, appearing to read 'Nick Conte'.

Nick Conte  
Environmental Technologist

[nicholas.conte@tulloch.ca](mailto:nicholas.conte@tulloch.ca)

Reviewed By:

A handwritten signature in black ink, appearing to read 'Tyler Moody'.

Tyler Moody, A.Sc.T.  
Project Manager

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Encl.

# Distribution List

# Of Hard Copies	PDF Required	Association / Company Name
	1	Huron-Superior Catholic District School Board

# Revision Log

Revision #	Revised By	Date	Issue / Revision Description

## Executive Summary

TULLOCH was commissioned by Huron-Superior Catholic District School Board (Client) to complete a pre-renovation focused designated substance and hazardous materials survey (FDS&HMS) in support of the proposed renovation, including a retrofit of the mechanical Heating Ventilation and Air Conditioning (HVAC) system along with replacement of electrical and interior finishes throughout existing corridors, classrooms, washrooms and staff room at Our Lady of Fatima Catholic School, located at 14 Strathcona Street, Chapleau, Ontario (the 'Site'). The location of the areas surveyed can be found in Figure 1.

The terms of reference for this project, are based on the Clients email approval.

The objective of this FDS&HMS was to provide a comprehensive summary of substances that require removal and/or management prior to completing renovation at the Site. The FDS&HMS included the collection of building material samples suspected of containing lead. Furthermore, the Site was investigated for the potential presence of designated substances as defined by Ontario Regulation 490/09 (O. Reg. 490/09) and hazardous materials as defined by various regulations.

TULLOCH understands that the areas assessed are scheduled for renovation. Based on TULLOCH's FDS&HMS, the following designated substances and potentially hazardous materials were identified within the Site:

- Asbestos cement pipes (transite) were found as rainwater leaders in the ceiling cavity of room 129, along the exterior wall of room 126 and along the interior wall of the storage room adjacent to room 23. Asbestos cement pipes are known to contain chrysotile asbestos. Approximately 60 linear feet of asbestos cement piping was identified. It should be assumed that all rainwater leaders are constructed using asbestos cement piping.
- Drywall joint compound (S-013A-C) throughout the building on walls and ceilings contains chrysotile asbestos.
- Grey 9"x 9" vinyl floor tiles and mastic (S-012A-C) contains chrysotile asbestos. Grey 9" vinyl floor tiles were found in the closet of room 22.
- Grey vinyl sheet flooring and mastic (S-0010A-C) is considered to be non-friable asbestos material based on the mastic containing chrysotile asbestos and the inability to separate the two materials.
- Black boards and cork boards were found throughout the building. When installed, the boards may have been glued to the walls. The glue pods on the back of the boards can contain asbestos, however, this material cannot be assessed without full removal of the board. Any glue pods on the back of black boards or cork boards should be assumed to be asbestos containing until tested and confirmed otherwise.

Due to the limited visibility above the ceiling tiles and behind radiators and walls it is possible some asbestos containing pipe insulation on straights and elbows could be present in concealed areas. Additional pipes might be present in wall cavities or under mill work. If any pipe insulation is encountered which is not fibreglass wrapped with a paper/foil jacket, it should be assumed to be asbestos containing. Previous abatement of asbestos containing pipe insulation and parging cement was completed at the Site, in accessible areas (crawlspace). It should be assumed

that all block walls and pipe chases adjacent to washrooms and any other service areas will contain asbestos containing pipe insulation and parging cement on elbows, joints and Ts.

Destruction of concrete block walls may reveal some older pipe insulation that could not be quantified during the survey without complete demolition. When demolishing walls, the contractor should pay careful attention to the type of pipe insulation and report any materials that differ from those identified in this report.

- Lead is considered to be present throughout the Site in wiring connectors, grounding conductors, solder and emergency back-up lights (lead-acid batteries).
- Lead green primer (LP04) was found on the structural steel. The green primer had elevated concentrations of lead in the paint at 0.1350% lead.
- If paint containing concentrations of lead less than 0.1% will be cut, ground, or burnt to facilitate removal, it is recommended that a 150 mm strip of paint be removed around the cut area by using a chemical gel stripper.
- Lead is considered to be present throughout the Site in wiring connectors, grounding conductors and solder.
- Fluorescent light tubes contain mercury vapour. Light tubes are present throughout the survey area.
- Concrete materials, which have the potential of containing silica, were used in masonry, mortar and concrete materials used for foundations, floors, and walls.
- Two refrigerator/freezers were observed. Any appliances that are scheduled for replacement or disposal should be properly disposed of at a recycling site so refrigerants can be evacuated.
- Concrete materials, which have the potential of containing silica, were used in masonry, mortar, brick, and concrete materials used for foundations.

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## 1. INTRODUCTION

### 1.1 Terms of Reference

TULLOCH was commissioned by the Huron-Superior Catholic District School Board (Client) to complete a pre-renovation designated substance and hazardous materials survey (DS&HMS) in support of the proposed renovation, including a retrofit of the HVAC system along with replacement of electrical and interior finishes throughout existing corridors, classrooms, washrooms, and staff room at Our Lady of Fatima Catholic School, located at 14 Strathcona Street, Chapleau, Ontario (the 'Site'). The location of the areas surveyed can be found in Figure 1.

The terms of reference for this project, are based on the Clients email approval.

### 1.2 Objective

The objective of this FDS&HMS was to provide a comprehensive summary of substances that require removal and/or management prior to renovation at the Site. The FDS&HMS included the collection of building material samples suspected of containing asbestos and lead. Furthermore, the Site was investigated for the potential presence of designated substances as defined by Ontario Regulation 490/09 (O. Reg. 490/09) that will be disturbed during construction including:

- Acrylonitrile
- Ethylene Oxide
- Arsenic
- Lead
- Benzene
- Silica
- Asbestos
- Mercury
- Isocyanates
- Coke Oven Emissions
- Vinyl Chloride

The following potentially hazardous materials were also investigated that are commonly found in commercial buildings:

- Fecal Waste
- Polychlorinated Biphenyls (PCBs)
- Mould
- Radioactive Smoke Detectors
- Ozone Depleting Substances (ODS)
- Urea Formaldehyde Foam Insulation (UFFI)
- Naturally Occurring Radioactive Materials (NORMs)

### 1.3 Applicable Regulations and Guidelines

The FDS&HMS was completed to address the following applicable regulatory requirements and guidelines for the management of designated substances and hazardous materials;

- Ontario Occupational Health & Safety Act – R.S.O. 1990, as amended, including
  - Designated Substances – Ontario Regulation 490/09, as amended
  - Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations – Ontario Regulation 278/05
- Ontario Environmental Protection Act – R.S.O. 1990, as amended, including
  - General – Waste Management R.R.O. 1990, Ontario Regulation 347, as amended
  - Ozone Depleting Substances and Other Halocarbons – Ontario Regulation 463/10, as amended
  - Waste Management – PCBs, Regulation 362, as amended
- Ministry of Labour Guidelines “*Lead on Construction Projects*”, dated September 2004
- Ministry of Labour Guidelines “*Silica on Construction Projects*”, dated September 2004
- Environment Canada Document “*PCB Identification of Lamp Ballasts Containing PCBs*” dated August 1991
- Canadian Construction Association (CCA), Standard Construction Document 82-2004, “*Mould Guidelines for the Canadian Construction Industry*”, 2004
- Environmental Abatement Council of Ontario “*Mould Abatement Guidelines*”, 2<sup>nd</sup> Edition, 2010
- Environment and Climate Change Canada “PCB Regulations (SOR/2008-273)”

### 1.4 Site Description

The date of construction of the structure is unknown, but it is estimated to have been built in the 1960s. The building located at the Site is an institutional structure that is two storeys in height and has always been used as a school. The structure had undergone a small addition, which was constructed onto the west side of the school in 1972.

On March 29, 2022, TULLOCH completed an intrusive survey of the interior and exterior (excluding the roof) of the building. The following descriptions relate only to those portions of the Site and structure that were assessed and available for direct observation at the time of inspection.

Building Component	Description
Exterior Cladding	Brick veneer and metal siding panels
Foundation	Cast in place concrete footings and concrete slab
HVAC	Natural gas boiler and forced air furnace
Roof	N/A
Flooring	Concrete, vinyl floor tiles, vinyl sheet flooring, ceramic tiles, and terrazzo
Interior walls	Concrete block and drywall
Ceilings	Drywall and acoustic ceiling tiles

## 1.5 Scope of Work

To satisfy the objectives for the management, transportation and disposal of designated substances associated with the demolition of the structure located at the Site, the scope of work included:

- 1) A comprehensive survey of building infrastructure to identify and quantify potential ACM. The survey was intrusive in nature and was limited to safe accessible areas including wall and ceiling cavities.
- 2) An intrusive inspection of building materials in the area to be disturbed by demolition activities to identify asbestos containing materials. Suspected asbestos containing samples were collected and relinquished to an accredited laboratory for analyses.
- 3) An intrusive inspection of coating materials in the demolition area to identify suspect lead paint materials. Suspected lead-based paint samples were collected and relinquished to an accredited laboratory for analyses.
- 4) An intrusive inspection of caulking and sealant materials in the renovation area to identify suspect PCB containing materials.
- 5) A survey of accessible areas of buildings and properties to identify and quantify devices that have the potential to contain ODSs.
- 6) A comprehensive survey of building infrastructure in the area to be disturbed by renovation activities to identify and quantify other designated substances and/or potentially hazardous materials of concern.
- 7) A report summarizing the FDS&HMS, identifying substances and/or materials to be managed to protect occupants and contractor personnel conducting demolitions.

## **1.6 Safety, Health, and the Environment**

Prior to commencing with the field component of this FDS&HMS, TULLOCH reviewed safety, health, and environmental concerns relevant to the Site, as well as the tasks involved with completing the work that would expose workers, the public or the environment to any hazards. At the time the field work began, TULLOCH identified health concerns associated with exposure to asbestos fibres during the sampling process; therefore, TULLOCH implemented safe working practices that included the wearing of a full-face respirator equipped with P100 cartridges during the sampling period when potentially friable asbestos containing materials were sampled.

No other health and safety concerns were identified that would pose unsafe or hazardous working conditions. Safe work practices were implemented throughout the project, and no injuries or impairment to the environment was recorded.

## **1.7 Survey and Reporting Limitations**

TULLOCH was granted full access to all areas of the building that will be renovated. The possibility remains that unexpected environmental conditions may be encountered at the Site in locations not specifically observed or investigated.

TULLOCH did not inspect the existing roof.

TULLOCH requested copies of all past asbestos surveys and management plans and designated substance surveys. TULLOCH was provided with the following asbestos survey for the site:

- Report entitled “*Asbestos Containing Building Material Survey and Management Program, Our Lady of Fatima, Chapleau, Ontario*” (MRW 2007 report) written by M.R. Wright and Associates Co. Ltd. and identified as report No. 7738.15 and dated July 2007.
- Report entitled “*Our Lady of Fatima, 14 Strathcona Street, Chapleau, Ontario, Asbestos Abatement Program*” written by Gerhard Technical Services Inc. and dated August 5-15, 2014.

TULLOCH makes no other evaluations whatsoever, including those concerning the legal significance of designated substances. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with one’s own legal counsel.

# **2. METHODOLOGY**

## **2.1 Asbestos Survey**

The review of on-Site structures was destructive in nature to document the general composition of building materials. Because of the scheduled substantial renovation of the structure, sampled areas were not restored and an

assessment of the condition and accessibility of the materials as required by an asbestos management plan was not completed.

The destructive investigation means that holes were advanced in any area suspected of containing asbestos containing materials. ACM surveys generally include the assumption, accepted as industry standard practice that various building materials are known to contain asbestos fibres, and are not sampled if they cannot be accessed and sampled safely.

Where required, bulk samples were collected from building materials suspected to contain asbestos fibres. Sufficient sample was collected for laboratory analytical requirements, which includes multi-layered building materials (plaster on plaster), for which each layer was analysed separately. The laboratory was instructed to discontinue analysis (stop-positive) on subsequent samples in the same series when asbestos was identified in one of the samples.

Sampling and analysis of suspect ACMs was completed in accordance with Ontario Regulation 278/05, U.S. Environmental Protection Agency Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, June 1993.

## **2.2 Lead**

Surfaces considered suspect of being coated with old lead containing paint were inspected and random samples of old/glossy paints were collected for lead analysis. Analysis was completed in accordance with ICPMS Soil for Determination of Metals in Soil by ICP/MS and BCSALM Method. Locations that were inaccessible for sampling (gymnasium ceilings and ductwork) were assumed to contain lead.

## **2.3 Polychlorinated Biphenyl (PCB)**

Sealants suspected of containing PCBs were not found, therefore, laboratory analysis completed in accordance with EPA, 1994. "Method 3541 (SW-846) Automated Soxhlet Extraction", Revision 0 was not required.

## **2.4 Other Designated Substances and Hazardous Materials**

TULLOCH further reviewed the Site to visually identify and quantify designated substances and hazardous materials including mercury and PCBs. Devices that may contain ODSs or being potentially radioactive were quantified and building materials suspected of containing UFFI, silica or that appeared to support mould or bacteria growth were documented and reported. The following Designated Substances typically are not found in building materials and if present are generally in a composition that is not considered hazardous.

- Benzene
- Coke oven emissions
- Ethylene oxide

- Isocyanates
- Vinyl chloride

### 3. SURVEY FINDINGS

#### 3.1 Asbestos

On March 29, 2022, TULLOCH completed the survey and identified building materials suspected of containing asbestos fibres. In total, 42 samples of fourteen visually distinct materials were collected and forwarded to EMC Scientific Incorporated (EMC) for analysis. Quantities of asbestos containing materials are identified below, however, these estimates are based on visual confirmation only. See Figure F1, for locations of identified asbestos containing materials. Additional asbestos containing materials may be present in wall and ceiling cavities, pipe chases or bulkheads throughout the building that could not be identified and quantified without full demolition of building systems.

##### 3.1.1 Asbestos Cement Products (Non-friable)

Asbestos cement pipe (transite pipe) was identified as rainwater leaders in the ceiling cavity of room 129, along the exterior wall of room 126 and along the interior wall of the storage room adjacent to room 23. Asbestos cement pipe is known to contain chrysotile asbestos.

Due to the limited visibility above the ceiling and behind walls, it is possible some transite pipe may be present in other concealed areas. Additional pipes might be present in wall cavities or under mill work. If transite pipe is encountered which is not identified in this report, it should be assumed to be asbestos containing.

Destruction of concrete block walls may reveal some older pipe insulation that could not be quantified during the survey without complete demolition. When demolishing walls, the contractor should pay careful attention to the type of pipe and report any materials that differ from those identified in this report.



Asbestos containing pipe (transite pipe) is known to contain chrysotile asbestos.

### 3.1.2 Sheet Vinyl Flooring/Mastic (Non-friable)

One type of sheet vinyl flooring and mastic was identified in the survey area as follows:

Sample Number	Colour and Size	Location if Asbestos Containing	Asbestos Type	Asbestos Type (Mastic)
S-010A-C	Grey	Storage room adjacent to room 22	None Detected	<b>Chrysotile</b>

See figure F1 for the locations of non-friable asbestos containing sheet vinyl flooring and/or mastic. Asbestos containing sheet vinyl flooring identified in this report may be found under millwork in rooms that have newer flooring (washroom of staff room – room 19) and should be investigated during renovation work if being disturbed. All grey vinyl sheet flooring should be considered asbestos containing as the vinyl sheet flooring cannot be separated from the mastic, however, all the material is considered non-friable.



All the grey sheet vinyl flooring (S-010A-C) and mastic is considered a non-friable asbestos-containing.



### 3.1.3 Vinyl Floor Tiles/Mastic (Non-friable)

Seven types of visually distinct vinyl floor tiles/mastic were found within the survey area, as follows:

Sample Number	Colour and Size	Location of Flooring	Asbestos Type – (Vinyl Floor Tile)	Asbestos Type (Mastic)
S-002A-C	Light blue 12"	Rooms 28C, 126, 131, 132, 221, 223, 225,	None Detected	None Detected
S-005A-C	White with brown flecks 12"	Rooms 16, 17	None Detected	None Detected
S-006A-C	Beige with brown flecks 12"	Rooms 14, 228	None Detected	None Detected
S-007A-C	Black & brown flecks 12"	Rooms 11, 12, 18,	None Detected	None Detected
S-008A-C	Orange & green flecks 12"	Rooms 19, 21	None Detected	None Detected
S-009A-C	Pink & white 12"	Room 22, 23	None Detected	None Detected
<b>S-012A-C</b>	<b>Grey 9"</b>	<b>Closet of room 22</b>	<b>Chrysotile</b>	<b>Chrysotile</b>
None	Light grey 24"	N/A	Known not to contain based on size and estimated age	Known not to contain based on size and estimated age
None	Dark grey with specks 24"	N/A	Known not to contain based on size and estimated age	Known not to contain based on size and estimated age

See figure F1 for asbestos containing floor tile areas. The asbestos containing vinyl floor tiles identified in this report may be found under millwork in rooms that have newer flooring and should be investigated during renovation work.



Light blue 12" vinyl floor tile and mastic (S-002A-C) does not contain asbestos.



White with brown flecks 12" vinyl floor tile and mastic (S- 005A-C) does not contain asbestos.



Beige with brown flecks 12" vinyl floor tile and mastic does not contain asbestos (S-006A-C).



Black and brown flecks 12" vinyl floor tile and mastic does not contain asbestos (S-007A-C).



Orange and green flecks 12" vinyl floor tile and mastic does not contain asbestos (S-008A-C).



Pink and white 12" vinyl floor tile and mastic does not contain asbestos (S-009A-C).



Grey 9" vinyl floor tile and mastic contains chrysotile asbestos (S-012A-C).



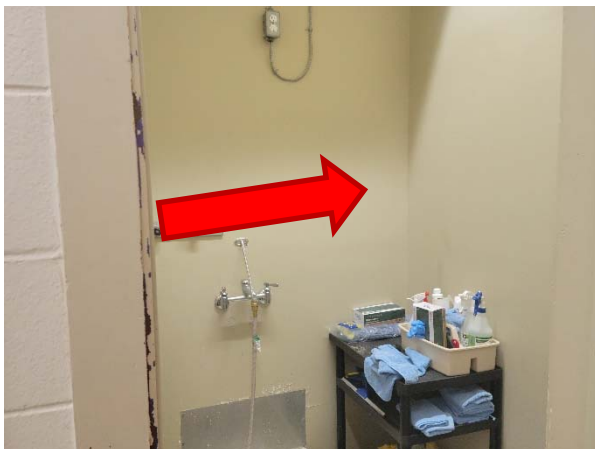
Light grey 24" vinyl floor tiles are known to not contain asbestos based on size and estimated age.



Dark grey with specks 24" vinyl floor tiles are known to not contain asbestos based on size and estimated age.

#### 3.1.4 Drywall Joint Compound (Non-friable)

Drywall joint compound was found throughout the building. Drywall joints on walls and ceilings were noted to have varying quantities of drywall joint compound. One set of three drywall joint compound samples were collected and sent for analysis (S-013A-C). Drywall joint compound throughout the Site contains chrysotile asbestos.



Varying quantities of drywall joint compound is present in joints on the ceilings, walls, and bulkheads throughout the structure contains chrysotile asbestos.

#### 3.1.5 Plaster (Non-Friable)

Plaster on walls and ceilings was not found within the survey area.

#### 3.1.6 Stucco (Non-Friable)

Stucco on walls and ceilings was not found within the survey area.

### 3.1.7 Duct Insulation and Insulation Board Materials (Friable)

Duct insulation was found in some areas within the survey boundaries and consisted of fibreglass insulation wrapped with foil.



Fibreglass insulation wrapped with foil is known not to contain asbestos.

### 3.1.8 Textured Finishing Materials (Friable)

Textured finish materials were not found within the survey area.

### 3.1.9 Acoustic Ceiling Tiles (Friable)

Two types of visually distinct acoustic ceiling tiles were found within the survey area, as follows:

Sample Number	Description and Size	Location if Asbestos Containing	% Asbestos and Type
S-001A-C	24" x 48" white with pinhole	NA	None detected
N/A	24" x 48" white fibreglass	NA	Known not to contain asbestos





24" x 48" white with pinholes acoustic ceiling tile does not contain asbestos (S-001A-C).



24" x 48" white fiberglass acoustic ceiling tiles are known not to contain asbestos.

### 3.1.10 Vermiculite Insulation (Friable)

Vermiculite insulation was not found in the survey area. Four locations of concrete block wall were inspected, and none contained vermiculite. Other exterior walls were observed to contain fiberglass insulation. The ceiling cavities were inspected via ceiling tiles and found to contain no insulation.

### 3.1.11 Pipe Insulation Materials (Friable)

Pipe insulation was found throughout the Site. Pipe insulation was investigated by cutting inspection holes in straights, elbows, and T's.

Canvas wrapped fiberglass pipe insulation was noted throughout the building. Canvas wrapped fiberglass pipe insulation is known not to contain asbestos, however, it is common during installation to use paring cement on butt joints and seams.

Canvas wrapped paper pipe insulation was noted in the storage room adjacent to room 23. One set of three canvas wrapped paper pipe insulation samples were collected and sent for analysis (S-011A-C). The canvas wrapped paper pipe insulation does not contain asbestos.

Foil wrapped fiberglass insulation was also observed throughout the building with elbows consisting of fiberglass covered with foil. Foil wrapped fiberglass insulation is presumed not to contain asbestos.

Plastic wrapped fiberglass pipe insulation was identified in the boiler room. This is newer insulation and known not to contain asbestos.

Due to the limited visibility above the ceiling tiles and behind radiators and walls, it is possible some asbestos containing pipe insulation on straights and elbows could be present in concealed areas. Additional pipes might be

present in wall cavities or under mill work. If any pipe insulation is encountered which is not fiberglass wrapped with a paper/foil jacket, it should be assumed to be asbestos containing.

Destruction of concrete block walls may reveal some older pipe insulation that could not be quantified during the survey without complete demolition. When demolishing walls, the contractor should pay careful attention to the type of pipe insulation and report any materials that differ from those identified in this report.



Canvas wrapped pipe insulation does not contain asbestos (S-011A-C).



Foil wrapped fiberglass pipe insulation is known not to contain asbestos.



Plastic wrapped fiberglass pipe insulation is known not to contain asbestos.

### 3.1.12 Caulking Materials (Non-Friable)

Caulking was not found within the survey area.

### 3.1.13 Mechanical Insulation

Mechanical insulation observed on site is presumed to be non-asbestos based on date of manufacture.



Boiler insulation is known not to contain asbestos.



Hot water tank insulation is known not to contain asbestos.

### 3.1.14 Floor Leveling Compound

Leveling compound was not found in the survey area.

### 3.1.15 Sprayed/Troweled-On Fireproofing

Sprayed on fireproofing was not found in the survey area.

### 3.1.1 Roofing and Asphalt Siding

Asphalt siding products were not found in the survey area. An assessment of the roof was not in the scope of this survey.

### 3.1.2 Asphalt Bitumen

Asphalt bitumen was not found within the survey area.

### 3.1.3 Other Materials

Two types of vinyl baseboard were found throughout the survey area, as follows:

Sample Number	Description and Size	% Asbestos and Type
S-003A-C	Brown mastic on blue rubber baseboards	None detected
S-004A-C	Brown mastic on black rubber baseboards	None detected





Brown mastic on blue vinyl baseboards does not contain asbestos (S-003A-C).



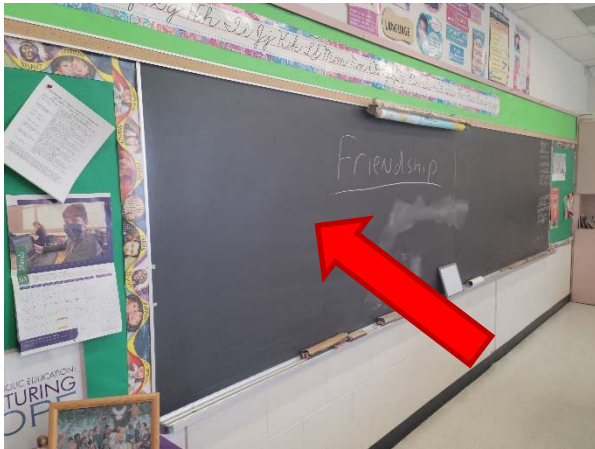
Brown mastic on black vinyl baseboards does not contain asbestos (S-004A-C).

Grey mortar was found throughout the building in the concrete block walls. One set of three concrete mortar samples was collected and sent for analysis (S-014A-C). Concrete mortar throughout the site does not contain asbestos.



Concrete mortar found throughout the site in the concrete block walls does not contain asbestos (S-014A-C).

Black boards and cork boards were found throughout the building. The blackboard material was metal in the locations inspected. When installed, the boards may have been glued to the walls. The glue pods on the back of the boards can contain asbestos, however, this material cannot be assessed without full removal of the board. Any glue pods on the back of black boards or cork boards should be assumed to contain chrysotile asbestos until tested and confirmed otherwise.



Glue pods could be present behind blackboards and cork boards throughout the building. Glue pods should be assumed to contain chrysotile asbestos.

Other materials suspect of containing asbestos were not found during the assessment.

### 3.2 Lead

Painted surfaces with a glossy finish, typically indicative of lead-based paint, were found throughout the Site. A total of six paint samples were collected from surfaces inside the building which will potentially be disturbed during demolition/renovation and analysed to determine the concentration of lead. Analytical reports for all samples are provided in Appendix A.

The US EPA definition of lead-based paints is *"in order for it to be considered lead-based paint, the paint must have greater than or equal to 0.5% (which is the same as 5,000 µg/g or 5,000 mg/kg or 5,000 ppm) lead"*<sup>1</sup>. The Ontario Ministry of Labour (MOL) does not have a lower limit for lead paint concentrations for which precautions must be considered and does not recognize the U.S. Environmental Protection Agency (EPA) limits (greater than 0.5%) for lead for this purpose. TULLOCH refers to The Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance and Repair that suggests that 0.1% (1,000 ppm) lead in paint represents a "De minimus" or "virtually safe" concentration of lead in paint for construction hygiene purposes. Lead concentrations in paint below 0.1% should not be the limiting hazard when using non-aggressive methods such as chipping, scraping, or sanding to disturb paint finishes. Aggressive methods (torching, cutting with power tools or welding) may still create an airborne hazard with lead concentrations at or below 0.1%. All paints containing lead at a concentration above 0.1% shall be considered in this report as lead containing and requiring further assessment to determine appropriate abatement/work procedures. All sampled paint was also evaluated for flaking, chipping,

<sup>1</sup> US EPA Document "Testing your home for Lead, paint, dust and soil", EPA 747-K-00-001, July 2000

and spalling. Based on Caduceon's analytical report for the submitted sample, one of the samples of paint contains concentrations of lead above 0.1%. Refer to the table below for a summary of lead paint samples and results.

Test	Location	Colour	Test Result (%)
LP01	Paint on concrete block wall, room 126	Beige	0.0280
LP02	Paint on wood door frame, room 14	Brown	<0.0005
LP03	Paint on concrete block wall, room 19	Yellow	0.0116
<b>LP04</b>	<b>Primer on structural steel, room 18</b>	<b>Green</b>	<b>0.1350</b>
LP05	Paint on concrete block wall, room 18	White	0.0018
LP06	Beige on structural steel, room 18	Beige	0.0526

**0.00%** - Paint with Lead Content above 0.1%

Paint on most surfaces was in good condition with some areas of localized peeling. Paint on the washroom stalls and lockers was not sampled. The washroom stalls and lockers can be removed without damaging the paint surfaces.



Beige paint on concrete block contains 0.0280% lead (LP01).



Brown paint on wood door frame contains <0.0005% lead (LP02).



Yellow paint on concrete block contains 0.0116% lead (LP03).



Green primer on structural steel contains elevated concentration of 0.1350% lead (LP04).



White paint on concrete block contains 0.0018% lead (LP05).



Beige primer on structural steel contains 0.0526% lead (LP06).

### 3.2.1 Other Lead Sources

Lead is also considered to be present throughout the Site in the following locations that may be disturbed during demolition:

- Lead acid batteries in emergency lighting throughout the building.
- Wiring connectors, grounding conductors and solder.

### 3.3 Mercury

At the time of our visit, fluorescent lamps were observed to be in use throughout mechanical and boiler rooms. Fluorescent lamps contain mercury vapour. Fluorescent lamps should be removed intact and properly disposed of.

Most lighting throughout the building was noted to be newer LED fixtures and is not known to be a source of mercury.

Mercury containing thermostats were observed during the assessment, some thermostats could not be dismantled to inspect for mercury. All thermostats should be inspected prior to disposal to confirm they do not contain mercury switches. If being removed, mercury containing thermostats should be carefully removed and disposed of properly.



Thermostats could not be dismantled and should be inspected for mercury prior to disposal.



Mercury vapour is present in florescent lamps. Ballasts should be inspected for PCB prior to removal.

### 3.4 Urea Formaldehyde Foam Insulation (UFFI)

UFFI was not found in the survey area.

### 3.5 Ozone Depleting Substances (ODS)

Two residential refrigerator/freezers were observed in Staff rooms. The refrigerators may contain refrigerant that may be ozone depleting. If being disposed of, all appliances should be properly disposed of at a recycling site so refrigerants can be properly removed.

### 3.6 Polychlorinated Biphenyls

The survey area contained a potential mix of T5 or T8 bulbs across the ceiling of the fan/mechanical rooms. The main office and hallways are known to have been upgraded to LED lights in the last few years. T5 and T8 fixtures contain electronic ballasts that do not contain PCBs. Light fixtures were energized at the time of the survey and therefore were not dismantled for intrusive inspection.

Old caulking that was suspected of containing PCBs was not found at the Site within the survey area.



### **3.7 Silica Containing Materials**

Concrete materials, which have the potential of containing silica, were used in masonry, mortar and concrete materials used for foundations, floors, and walls.

### **3.8 Acrylonitrile**

Acrylonitrile is primarily released into the environment from the chemical and plastic production industries; therefore, the presence of acrylonitrile is unlikely at the site.

### **3.9 Arsenic**

Arsenic is used to manufacture hard, strong and corrosion resistant alloys. Arsenic compounds can also be found in pigments, animal poisons, insecticides, paints, wallpaper, ceramics, and poisonous gases manufactured for military purposes. The presence of arsenic and/or materials containing significant quantities of arsenic in the building envelope finishes is unlikely.

### **3.10 Benzene**

Benzene is used in industry primarily for the production of other chemicals used in the manufacturing of plastics, resins, nylon, synthetic fibres, rubbers, dyes, detergents, drugs and pesticides. Benzene is naturally occurring in crude oil, fuel oil, gasoline, and cigarette smoke.

### **3.11 Coke Oven Emissions**

Coke oven emissions are generated in the extraction of metals from ores and are generally associated with the manufacturing of iron and steel; therefore, based on the information gathered for the Site, and TULLOCH's survey, the presence of coke oven emissions is unlikely.

### **3.12 Ethylene Oxide**

Ethylene oxide is produced in large volumes throughout the world and is generally used as a chemical intermediate for the manufacturing of textiles, detergents, polyurethane foams, antifreeze, solvents, medicinal products, adhesives, and is used as a fumigant in agricultural products, and sterilizing agents. Based on the information gathered for the Site, and TULLOCH's survey, the presence of ethylene oxide in large quantities is unlikely.

### **3.13 Isocyanates**

Isocyanates are a raw material used in the production of polyurethanes, and widely used for the manufacturing of flexible/rigid foams, fibres, elastomers, and coatings such as paints and varnishes. Based on the information gathered for the Site, and TULLOCH's survey, the presence of isocyanates in large quantities is unlikely.

### **3.14 Vinyl Chloride**

Since vinyl chloride is primarily released into the environment as gas emissions or in wastewater from the production of polyvinyl chloride (PVC), the presence of vinyl chloride is unlikely; however, due to the release of vinyl chloride gas from the burning of electrical wiring or PVC pipes, the use of high heat or burning methods to dismantle electrical components or PVC pipes is not recommended.

Based on the information gathered for the Site, and TULLOCH's survey, the presence of vinyl chloride in large quantities is unlikely.

### **3.15 Radioactive Materials**

Smoke and heat detectors were observed within the hallways of the building. Smoke detectors may use ionization technology, which employs a small radioactive source as a key component in detecting smoke particles and may be present throughout the Site. If detectors are to be removed and disposed of, they should be taken to a licenced disposal facility.

Naturally Occurring Radioactive Materials (NORMs) usually consist of industrial wastes or by-products enriched with radioactive elements found in the environment, such as uranium, thorium, and potassium and any of their decay products, such as radium and radon.

Based on the information gathered for the Site, and TULLOCH's survey, the presence of NORMs is unlikely.

### **3.16 Other Chemicals, Substances or Hazardous Materials of Potential Concern**

No other chemicals, substances or hazardous materials of potential concern were observed in the survey area.

## **4. RECOMMENDATIONS**

The removal of all identified designated substances must be performed prior to disturbing the building substrate below. A qualified person should inspect the removal of all designated substances prior to proceeding with renovation/repair or demolition work.

A copy of this report must be given to all contractors working on the project.

### **4.1 Asbestos**

All non-friable asbestos containing materials with the potential of being disturbed, must be removed prior to commencing with renovation activities. All asbestos containing materials must be removed according to O. Reg 278/05 by qualified/certified asbestos workers.

All non-friable drywall joint compound less than 1 square metre should be removed using Type 1 precautions. The removal or disturbance of drywall joint compound greater than 1 square metre should be removed using Type 2 precautions.

Vinyl floor tiles and mastic should be removed using Type 1 precautions if using water and non-mechanical means. Should vinyl floor tiles be removed using mechanical methods or without water it should be removed using Type 3 precautions.

Asbestos cement pipes (transite) for rainwater leaders should be removed using Type 1 or 2b glove bag precautions.

Vinyl sheet flooring with asbestos containing mastic should be removed using Type 1 precautions. Should mastic layer be removed using mechanical methods it should be removed using Type 3 precautions.

## **4.2 Lead**

Building materials confirmed or assumed to contain lead (i.e., solder, wiring connections, copper pipes, paint, etc.) should be removed and properly recycled.

Paint confirmed to contain greater than 0.1% lead by volume should be abated prior to demolition. If paint containing concentrations of lead less than 0.1% will be cut, ground, or burnt to facilitate removal, it is recommended that a 150 mm strip of paint be removed around the cut area by using a chemical gel stripper.

Waste materials which exceed the Leachate Quality Criteria for lead of 5 ppm, as established using the Toxicity Characteristic Leaching Procedure (TCLP) per O. Reg. 347 (as amended) are considered lead hazardous wastes and must be transported and disposed of at a licensed facility. Leachate testing of certain materials may be required prior to disposal.

## **4.1 Mercury**

All light tubes should be removed intact, packaged in drums, and disposed of at a licensed disposal facility.

Suspect mercury thermostats were not found throughout the building. If mercury thermostats found and are to be replaced, the mercury devices should be carefully dismantled and properly disposed of at a licensed facility. Materials consisting of elemental, inorganic or organic mercury that exceed the Leachate Quality criteria of 0.1 ppm, as established by Regulation 347 (as amended) TCLP, cannot be disposed of at a solid non-hazardous waste site. The waste removal contractor should be responsible for finding a source for the disposal of materials containing mercury. Mercury is also listed in the *"Transportation of Dangerous Goods Act"*; therefore, specific requirements apply for the transportation of materials containing mercury.



Management, handling, and disposal of mercury containing equipment such as thermostats and fluorescent light tubes should be in accordance with O. Reg. 347 (as amended) and O. Reg. 490/09.

#### **4.2 Silica Containing Materials**

Samples of building materials were not relinquished for silica analysis. Cast in place concrete slabs, foundations and masonry are likely to contain silica, since silicon dioxide is the basic component of sand, sandstone, slate, flint, quartz, and granite rock. The Waste Diversion Act, O. Reg. 102/94, specifies that materials containing silica or that have the potential of containing silica should not be disposed of at a landfill. Exposure to fine dust containing airborne silica becomes a health issue when inhaled. Engineering control, such as wetting materials during demolition/construction activities should be used in order to limit the accumulation of dust. O. Reg. 490/09 and the Ministry of Labour document “*Guideline – Silica on Construction Projects*” (September 2004), should be referred to when demolishing materials that may contain silica.

## 5. Statement of Qualifications and Limitations

The attached Report (the “Report”) has been prepared by TULLOCH Engineering (“Consultant”) for the benefit of the client (“Client”) in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the “Agreement”).

The information, data, recommendations, and conclusions contained in the Report (collectively, the “Information”):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the “Limitations”)
- represents Consultant’s professional judgement in light of the Limitations and industry standards for the preparation of similar reports
- may be based on information provided to Consultant which has not been independently verified
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued
- must be read as a whole and sections thereof should not be read out of such context
- was prepared for the specific purposes described in the Report and the Agreement
- in the case of subsurface, environmental, or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental, or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information, or any part thereof.

The Report is to be treated as confidential and may not be used or relied upon by third parties, except: as agreed in writing by Consultant and Client

- as required by law
- for use by governmental reviewing agencies

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (“improper use of the Report”), except to the extent those parties have obtained the prior written consent of Consultant to use and rely



upon the Report and the Information. Any damages arising from improper use of the Report or parts thereof shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to, and forms part of the Report and any use of the Report is subject to the terms hereof.

## FIGURES

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### Figure F1: Sample Location Plan

K:\2022\Engineering\220791 HSCDSB - Our Lady of Fatima\Drawings and client documents\22-0791 - HSCDSB Our Lady of Fatima - DSS - 051122.dwg

LEGEND

X

(S-000)

ASBESTOS SAMPLE LOCATION

⊗

(LP-000)

LEAD PAINT SAMPLE LOCATION

SURVEY LIMITS BOUNDARY

ASBESTOS-CONTAINING TRANSITE PIPE

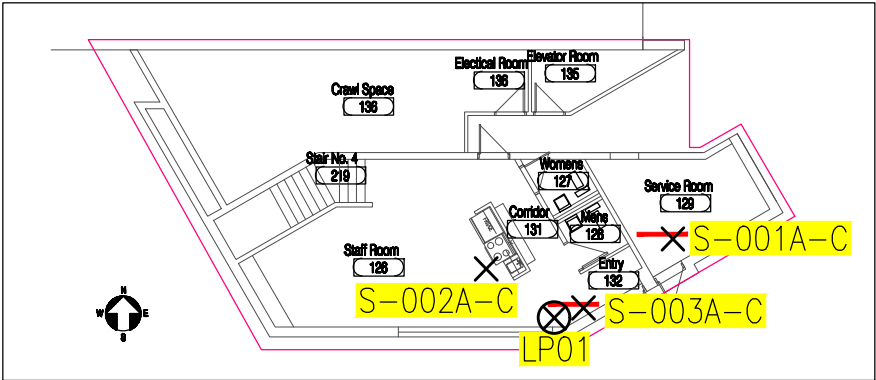
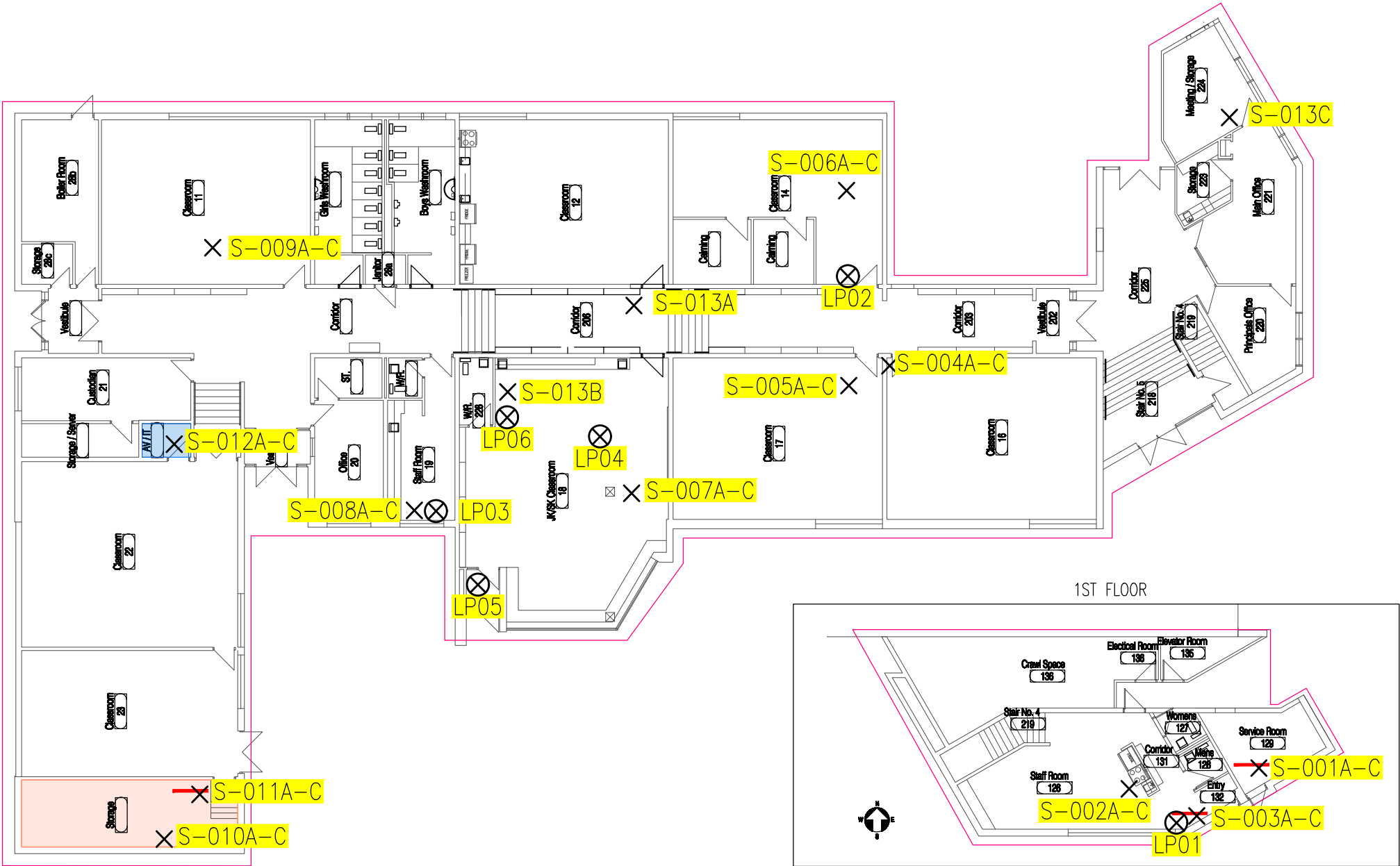
ASBESTOS-CONTAINING VINYL FLOOR TILES

ASBESTOS-CONTAINING SHEET VINYL FLOORING MASTIC

NOTES:

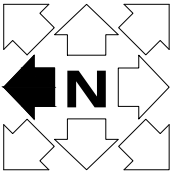
- DRYWALL JOINT COMPOUND PRESENT ON INTERIOR FINISHES CONTAINS CHRYSOTILE ASBESTOS
- BLACKBOARD AND CORK BOARDS GLUE PODS ARE PRESUMED TO CONTAIN ASBESTOS

SITE PLAN  
2ND FLOOR  
N.T.S.



TULLOCH

ISSUED FOR  
REPORT  
MAY 11, 2022



PROJECT:  
**HURON-SUPERIOR CATHOLIC DISTRICT  
SCHOOL BOARD - OUR LADY OF FATIMA CATHOLIC SCHOOL  
14 STRATHCONA STREET, CHAPLEAU, ON**

DRAWING:  
**FDS & HMS  
SAMPLE LOCATION PLAN**

ENGINEER'S SEAL

0	MAY 11, 2022	CM	BY	ISSUED FOR REPORT
No.	DATE			ISSUES / REVISIONS
DRAWN BY:		CHECKED BY:		PROJECT No.:
CM	TJCM	TJCM		22-0791
DESIGNED BY:		APPROVED BY:		DRAWING No.
NC	TJCM	TJCM		<b>F1</b>
SCALE:	NTS	DATE:	APR. 20, 2022	
				REVISION No.
				<b>0</b>

## **APPENDIX A**

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**EMC Scientific Certificate of Analysis**

# Laboratory Analysis Report

To:

**Nick Conte**  
Tulloch Engineering  
71 Black Road, Unit 8  
Sault Sainte Marie, Ontario  
P6B 0A3

**EMC LAB REPORT NUMBER:** A78253

**Job/Project Name:** Our Lady of Fatima Chapleau

**Analysis Method:** Polarized Light Microscopy – EPA 600

**Date Received:** Mar 31/22

**Date Analyzed:** Apr 7/22

**Analysts:** Chengming Li & Jayoda Perera

**Reviewed By:** Malgorzata Sybydlo, *Laboratory Manager*

**Job No:**

**Number of Samples:** 42

**Date Reported:** Apr 7/22

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS			
				Asbestos fibres		Non-asbestos Fibres	Non-fibrous Material
S-001A	A78253-1	24"x48" ACT w pinholes	Grey, ceiling tile	ND		75	25
S-001B	A78253-2	24"x48" ACT w pinholes	Grey, ceiling tile	ND		75	25
S-001C	A78253-3	24"x48" ACT w pinholes	Grey, ceiling tile	ND		75	25
S-002A	A78253-4	12" Light blue ACT	2 Phases: a) Light blue, vinyl floor tile b) Black, mastic	ND ND			100 100
S-002B	A78253-5	12" Light blue ACT	2 Phases: a) Light blue, vinyl floor tile b) Black, mastic	ND ND			100 100
S-002C	A78253-6	12" Light blue ACT	2 Phases: a) Light blue, vinyl floor tile b) Black, mastic	ND ND			100 100
S-003A	A78253-7	Brown mastic on blue baseboard	Brown, mastic	ND			100
S-003B	A78253-8	Brown mastic on blue baseboard	Brown, mastic	ND			100
S-003C	A78253-9	Brown mastic on blue baseboard	Brown, mastic	ND			100

**EMC LAB REPORT NUMBER:** A78253

**Client's Job/Project Name/No.:** Our Lady of Fatima Chapleau

**Analysts:** Chengming Li / Jayoda Perera

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS			
				Asbestos fibres		Non-asbestos Fibres	Non-fibrous Material
S-004A	A78253-10	Brown mastic on black baseboard	Brown, mastic	ND			100
S-004B	A78253-11	Brown mastic on black baseboard	Brown, mastic	ND			100
S-004C	A78253-12	Brown mastic on black baseboard	Brown, mastic	ND			100
S-005A	A78253-13	12" White w brown flecks VFT	2 Phases: a) White, vinyl floor tile b) Black, mastic	ND ND			100 100
S-005B	A78253-14	12" White w brown flecks VFT	2 Phases: a) White, vinyl floor tile b) Black, mastic	ND ND			100 100
S-005C	A78253-15	12" White w brown flecks VFT	2 Phases: a) White, vinyl floor tile b) Black, mastic	ND ND			100 100
S-006A	A78253-16	12" Beige w brown flecks VFT	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND ND			100 100
S-006B	A78253-17	12" Beige w brown flecks VFT	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND ND			100 100
S-006C	A78253-18	12" Beige w brown flecks VFT	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND ND			100 100
S-007A	A78253-19	12" Black & brown fleck VFT	2 Phases: a) Brown, vinyl floor tile b) Black, mastic	ND ND			100 100
S-007B	A78253-20	12" Black & brown fleck VFT	2 Phases:				



**EMC LAB REPORT NUMBER:** A78253

**Client's Job/Project Name/No.:** Our Lady of Fatima Chapleau

**Analysts:** Chengming Li / Jayoda Perera

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS			
				Asbestos fibres		Non-asbestos Fibres	Non-fibrous Material
			a) Brown, vinyl floor tile b) Black, mastic	ND ND			100 100
S-007C	A78253-21	12" Black & brown fleck VFT	2 Phases: a) Brown, vinyl floor tile b) Black, mastic	ND ND			100 100
S-008A	A78253-22	12" Orange & green fleck VFT	2 Phases: a) Orange, vinyl floor tile b) Black, mastic	ND ND			100 100
S-008B	A78253-23	12" Orange & green fleck VFT	2 Phases: a) Orange, vinyl floor tile b) Black, mastic	ND ND			100 100
S-008C	A78253-24	12" Orange & green fleck VFT	2 Phases: a) Orange, vinyl floor tile b) Black, mastic	ND ND			100 100
S-009A	A78253-25	12" Pink & white VFT	2 Phases: a) Pink, vinyl floor tile b) Black, mastic	ND ND			100 100
S-009B	A78253-26	12" Pink & white VFT	2 Phases: a) Pink, vinyl floor tile b) Black, mastic	ND ND			100 100
S-009C	A78253-27	12" Pink & white VFT	2 Phases: a) Pink, vinyl floor tile b) Black, mastic	ND ND			100 100
S-010A	A78253-28	Grey VSF	3 Phases: a) Grey, vinyl flooring b) Brown, cellulose backing c) Brown, mastic	ND ND Chrysotile	 1	10 90	90 10 99

**EMC LAB REPORT NUMBER:** A78253

**Client's Job/Project Name/No.:** Our Lady of Fatima Chapleau

**Analysts:** Chengming Li / Jayoda Perera

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS			
				Asbestos fibres		Non-asbestos Fibres	Non-fibrous Material
S-010B	A78253-29	Grey VSF	3 Phases: a) Grey, vinyl flooring b) Brown, cellulose backing c) NA	ND ND NA		10 90	90 10
S-010C	A78253-30	Grey VSF	3 Phases: a) Grey, vinyl flooring b) Brown, cellulose backing c) NA	ND ND NA		10 90	90 10
S-011A	A78253-31	Canvas pipe wrap & insulation	2 Phases: a) Off white, woven fibrous material b) Brown, layered paper with tar	ND ND		95 85	5 15
S-011B	A78253-32	Canvas pipe wrap & insulation	2 Phases: a) Off white, woven fibrous material b) Brown, layered paper with tar	ND ND		95 85	5 15
S-011C	A78253-33	Canvas pipe wrap & insulation	2 Phases: a) Off white, woven fibrous material b) Brown, layered paper with tar	ND ND		95 85	5 15
S-012A	A78253-34	9" Grey VFT	2 Phases: a) Grey, vinyl floor tile b) Black, mastic	Chrysotile Chrysotile	3 3		97 97
S-012B	A78253-35	9" Grey VFT	NA	NA			
S-012C	A78253-36	9" Grey VFT	NA	NA			
S-013A	A78253-	DJC corridor pillar	Off white, joint compound	Chrysotile	1		99

**EMC LAB REPORT NUMBER:** A78253

**Client's Job/Project Name/No.:** Our Lady of Fatima Chapleau

**Analysts:** Chengming Li / Jayoda Perera

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS			
				Asbestos fibres		Non-asbestos Fibres	Non-fibrous Material
	37 <sup>6</sup>						
S-013B	A78253-38	DJC rm 14 int wall	NA	NA			
S-013C	A78253-39	DJC rm 226 int wall	NA	NA			
S-014A	A78253-40	Conc block mortar	Grey, cementitious material	ND			100
S-014B	A78253-41	Conc block mortar	Grey, cementitious material	ND			100
S-014C	A78253-42	Conc block mortar	Grey, cementitious material	ND			100

**Note:**

1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.
5. Vinyl floor tiles may contain very fine asbestos fibres which the PLM method cannot detect. TEM analysis may be necessary to confirm the absence of asbestos.
6. Sample is small in size.

## **APPENDIX B**

---

### **Caduceon Certificate of Analysis**

**C.O.C.: ---**

**REPORT No. B22-08808**

**Report To:**

**EMC Scientific Inc.**  
5800 Ambler Dr. #100,  
Mississauga ON L4W 4J4 Canada

**Attention:** Alister Haddad

DATE RECEIVED: 01-Apr-22

DATE REPORTED: 04-Apr-22

SAMPLE MATRIX: Paint Chips

**Caduceon Environmental Laboratories**

2378 Holly Lane  
Ottawa Ontario K1V 7P1  
Tel: 613-526-0123  
Fax: 613-526-1244

JOB/PROJECT NO.: Our Lady of Fatima Chapleau

P.O. NUMBER:

WATERWORKS NO.

Parameter			Lead				
Units			µg/g				
R.L.			5				
Reference Method			EPA 6010				
Date Analyzed/Site			04-Apr-22/O				
Client I.D.	Sample I.D.	Date Collected					
LP01 Beige on Conc Block Wall	B22-08808-1	29-Mar-22	280				
LP02 Brown on Wood Door Frame	B22-08808-2	29-Mar-22	< 5				
LP03 Yellow on Conc Block Wall	B22-08808-3	29-Mar-22	116				
LP04 Green on Structural Steel	B22-08808-4	29-Mar-22	1350				
LP05 White on Concrete Block	B22-08808-5	29-Mar-22	18				
LP06 Beige on Structural Steel	B22-08808-6	29-Mar-22	526				

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie



Greg Clarkin, BSc., C. Chem  
Lab Manager - Ottawa District

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

**PART 1 - GENERAL****1.1 RELATED SECTIONS**

- .1 Division 1 – General Requirements.
- .2 Section 09 91 23 - Interior Painting.
- .3 Section 09 91 13 - Exterior Painting.

**1.2 REFERENCES**

- .1 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM)
  - .1 ANSI/NAAMM MBG531-[00], Metal Bar Grating Manual.
- .2 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM A 53/A 53M-[02], Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A 307-[02], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .3 ASTM A 325M-[02], Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.
  - .2 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.
  - .3 CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel.
  - .4 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 Canadian Standards Association (CSA International)
  - .1 CSA W59-[1989(R2001)], Welded Steel Construction (Metal Arc Welding/Imperial Version).
- .5 National Association of Architectural Metal Manufacturers (NAAMM)
  - .1 AMP 510-[92], Metal Stair Manual.
- .6 Steel Structures Painting Council (SSPC), Systems and Specifications Manual, Volume 2.

**1.3 SYSTEM DESCRIPTION**

- .1 Design, supply and Install the complete Guard and Handrail systems as shown on the drawings and details, including but not limited to the following:
  - .1 Interior and Exterior Metal balustrade, handrails, guardrails
- .2 Design drawings provided are diagrammatic and intended to convey the scope of the work. It shall be the responsibility of this trade to provide a complete, engineered, design and installation for the system.
  - .1 Design shall bear the stamp of a professional engineer, licensed in the appropriate province, attesting that the design provided is in compliance with the current codes and

standards and authorities having jurisdiction.

- .3 Refer to drawings and details for additional typical design requirements, and conform.
- .4 Guards shall meet OBC load requirements.

#### 1.4 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
    - .1 For finishes, coatings, primers and paints.
- .2 Shop Drawings
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate construction all plans sections and details showing, sizes configuration, dimension and location of all steel sections and material.
  - .3 Include design for all connection plates and bolting necessary and required to connect to the adjacent materials and systems as indicated in the Contract Documents.
  - .4 Site verify all dimensions prior to fabrication.
  - .5 Submit shop drawing bearing stamp of a qualified professional engineer registered in Province of Ontario.
    - .1 Seal shall attest to the conformance of the design with the provided design, OBC and Good Engineering practices.

#### 1.5 QUALITY ASSURANCE

- .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

#### 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Steel sections: to CAN/CSA-G40.20/G40.21 Grade 300 W.
- .2 Steel plate: to CAN/CSA-G40.20/G40.21, Grade 260 W.
- .3 Steel pipe: to ASTM A 53/A 53M, standard weight, schedule 40, and schedule 80. seamless black.
- .4 Steel tubing: to CAN/CSA-G40.20/G40.21, square, rectangular or round, sizes and dimensions as indicated.
- .5 Welding materials: to CSA W59.
- .6 Bolts: to ASTM A 307.
- .7 High strength bolts: to ASTM A 325M.

### 2.2 FABRICATION

- .1 Fabricate to NAAMM, Metal Stair Manual as a minimum standard. Where the drawings indicate work exceeding these standards, provide as detailed.
- .2 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.
- .3 Accurately form connections with exposed faces flush; mitres and joints tight. Make risers of equal height.
- .4 Grind or file exposed welds and steel sections smooth.
- .5 Shop fabricate stairs in sections as large and complete as practicable.

### 2.3 PIPE/TUBING HANDRAILS, GUARDRAILS AND BALUSTRADES

- .1 Construct handrails, guardrails and balusters from steel pipe, plate and steel rod. Refer to drawings and details.
- .2 Cap and weld exposed ends of balusters and handrails, see details.

### 2.4 FINISHES

- .1 Exterior: All exterior steel handrails and guardrails shall be provided with hot dipped galvanizing finish, post fabrication and pre installation.
- .2 Interior: All interior steel handrails and guardrails shall be provided with primed paint finish, in preparation for finish paint.
- .3 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CAN/CSA-G164.
- .4 Shop coat primer: to CAN/CGSB-1.40.



- .5 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

## 2.5 SHOP PAINTING

- .1 Clean surfaces in accordance with Steel Structures Painting Council Manual Volume 2.
- .2 Refer also to the requirements indicated on the drawings for preparation of steel prior to receiving finishes
- .3 Apply one coat of shop primer except interior surfaces of pans.
- .4 Apply two coats of primer of different colors to parts inaccessible after final assembly.
- .5 Use primer as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces, free from rust, scale, grease, do not paint when temperature is below 7 degrees C.
- .6 Do not paint surfaces to be field welded.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- .1 Install in accordance with NAAMM, Metal Stair Manual.
- .2 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting stairs to structure.
- .3 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .4 Do welding work in accordance with CSA W59 unless specified otherwise.
- .5 Grind all excess spatter from all field welding. Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

### 3.2 CLEANING

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-11.3-M87, Hardboard.
  - .2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
  - .3 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  - .4 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.
  - .4 CSA O121-M1978(R2003), Douglas Fir Plywood.
  - .5 CSA O141-05, Softwood Lumber.
  - .6 CSA O151-04, Canadian Softwood Plywood.
  - .7 CSA O153-M1980(R2003), Poplar Plywood.
  - .8 CAN/CSA-O325.0-92(R2003), Construction Sheathing.
  - .9 CSA O437 Series-93(R2006), Standards on OSB and Waferboard.
- .3 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2005.

### 1.2 SUBMITTALS

- .1 Submit Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.

### 1.3 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## PART 2 - PRODUCTS

### 2.1 FRAMING AND STRUCTURAL MATERIALS

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.

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- .2 Glued end-jointed (finger-jointed) lumber NLGA Special Products Standard SPS.
- .3 Structural Composite Lumber (SCL) in accordance with ASTM D 5456.
- .4 Framing and board lumber: in accordance with NBC.
- .5 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  - .1 Board sizes: "Standard" or better grade.
  - .2 Dimension sizes: "Standard" light framing or better grade.
  - .3 Post and timbers sizes: "Standard" or better grade.

## 2.2 PANEL MATERIALS

- .1 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.0.
- .2 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .3 Canadian softwood plywood (CSP): to CSA O151, standard construction.
- .4 Poplar plywood (PP): to CSA O153, standard construction.
- .5 Interior mat-formed wood particleboard: to ANSI 208.1.
- .6 Mat-formed structural panel boards (OSB wafer): to CAN3-O437.0.
- .7 Insulating fiberboard sheathing: to CAN/CSA-A247 CAN/ULC-S706.
- .8 Glass fiber board sheathing: non-structural, rigid, faced, fiberglass, insulating exterior sheathing board.
- .9 Gypsum sheathing: to ASTM C 36/C 36M.

## 2.3 ACCESSORIES

- .1 Polyethylene film: to CAN/CGSB-51.34, Type 1, 0.15 mm thick.
  - .1 Air seal: closed cell polyurethane or polyethylene.
- .2 General purpose adhesive: to CSA O112 Series.
  - .1 Maximum allowable VOC limit 140 g/L.
- .3 Nails, spikes and staples: to CSA B111.
- .4 Bolts: 12.5 min. mm diameter unless indicated otherwise, complete with nuts and washers.
- .5 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fiber plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- .6 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, sheet metal, formed to prevent dishing. Bell or cup shapes not acceptable.

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### 2.3 FASTENER FINISHES

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work interior highly humid areas pressure-preservative fire-retardant treated lumber.
- .2 Stainless steel: use stainless steel for locations noted on drawings, or as recommended by manufacturer's installation procedures

### 2.4 WOOD PRESERVATIVE

- .1 SCAQMD Rule #1113 - Architectural Coatings.
- .2 Maximum allowable VOC limit 350 g/L.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- .1 Store wood products.

### 3.2 INSTALLATION

- .1 Comply with requirements of NBC 2005 Part 9 supplemented by following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 Install wall sheathing in accordance with manufacturer's printed instructions.
- .6 Install roof sheathing in accordance with requirements of NBC.
- .7 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, specialties, Owner supplied ceiling or wall mounted fixtures and equipment (see Details and Schedules), and other work as required.
- .8 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .9 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .10 Install sleepers as indicated.
- .11 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

### 3.3 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary

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strength and rigidity.

- .2 Countersink bolts where necessary to provide clearance for other work.
- .3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

### 3.4 HOLLOW METAL STEEL DOORS AND FRAMES

- .1 Set frames plumb and square in their exact location. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head frame. Install temporary wood spreaders at mid-height.
- .2 Install fire rated door frames in accordance with Chapters 2 and 3 of NFPA 80

### 3.5 ELECTRICAL EQUIPMENT BACKING

- .1 Electrical equipment mounting boards:
  - .1 Plywood, DFP or CSP grade, or PP grade, square edge 19 mm thick.

### 3.5 ROUGH HARDWARE

- .1 Install rough hardware.
- .2 Fastening to hollow units shall be done with toggle bolts, to solid masonry or concrete with lead expansion shields and lag screws or lead plugs with wood screws. Use of organize fibre or wood plugs is not permitted.

### 3.6 FINISH HARDWARE

- .1 Install finish hardware supplied under Section 08 71 00.

### 3.7 NAILING STRIPS, BLOCKING, STRAPPING, FURRING, NAILERS, GROUNDS AND ROUGH BUCKS

- .1 Do not regard grounds, blocking, furring, and such other fastening provisions as shown on drawings as exact or complete. Provide required provisions for materials and fastenings as required, located and secured to suite site conditions and adequate for intended support.
- .2 Cut fastening work into lengths as long as practicable, and with square ends. Erect work plumb, in true planes, and fastened rigidly in place
- .3 Provide wood furring and strapping for applied facings, caseworks, etc.
- .4 Except where steel is specifically shown, provide wood blocking and supports in metal stud partitions for fastening of items anchored in and to stud partitions. Provide wood blocking and supplementary supports in metal studs supporting millwork, casework counters and similar items
- .5 Co-ordinate work of this section with the work of the entire contract, including but not limited to the following

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- .1 Finish Carpentry
- .2 Parapet construction
- .3 Exterior cladding
- .4 Washroom accessories
- .5 Miscellaneous accessories
- .6 Specialties
- .7 Mechanical backing boards
- .8 Electrical backing boards

3.8 CANTS, CURBS, PARAPET,  
AND FASCIA BACKING

- .1 Install wood cants, parapets, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .2 Roof Parapet to receive PVC roofing flashing shall be constructed with standard (non-pressure treated) lumber. PVC and the wood preservative are chemically non-compatible.
- .3 Roof Parapets to receive Asphaltic roof flashing shall be constructed with pressure treated (PT) lumber. (PT plywood and PT framing)
- .4 Construct all parapets with built-in 15mil poly air-vapour barrier transitions strip as indicated. Tape joints in poly. Seal wall and/or roof vapour barrier to this membrane.

3.9 MISCELLANEOUS  
CARPENTRY WORK

- .1 Supply and install all other carpentry shown on drawings or as required for completion of work. Cooperate with other trades in installing items supplied by other Sections, cut openings in woodwork when so required and make good disturbed surfaces.
- .2 Provide miscellaneous carpentry work as follows:
  - .1 Install all rough blocking, wood ledgers and grounds to support finishing hardware.
  - .2 Install all wood backboards and supports where required for mechanical and electrical equipment.
  - .3 Install all rough bucks and frames for windows, doors and miscellaneous openings.
  - .4 Layout and install all hollow metal door frames and screens.
  - .5 Install all finishing door hardware.
  - .6 Install blocking for window sills.
- .3 Cooperate and coordinate with other trades in installing items supplied by other Sections.

3.9 BLOCKING AND SUPPORT

- .1 Supply and install all blocking and support for specialties and equipment as indicated on the drawings, or as necessary or required. This shall include but is not limited to the following:
  - .1 Finish Carpentry
  - .2 Millwork and Casework
  - .3 Finish hardware
  - .4 Washroom and Change room partitions
  - .5 Washroom Specialties

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- .6 Miscellaneous Specialties
- .7 Mechanical Equipment
- .8 Electrical Equipment and panels
- .9 Furniture Fixtures and Equipment
- .10 etc.

.2 Cooperate with other trades in installing items supplied by other Sections, cut openings in woodwork when so required and make good disturbed surfaces.

.3 Except where steel is specifically shown, provide wood blocking and supports in metal stud partitions for fastening of items anchored to stud partitions. Provide wood blocking and supplementary supports in metal studs supporting counters and similar items

3.10 BASEMENT FOUNDATION  
DRAINAGE TRACK

.1 Supply and install basement foundation drainage track to the perimeter of the basement walls and connect to the sump pit. Caulk lengths of units together and seal and fasten to the floor as per manufacturers recommendations.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS .1 Division 1 – General Requirements  
.2 Section 07 27 00 – Air-Vapour Barriers  
.3 Section 07 92 00 – Joint Sealants
- 1.2 REFERENCES .1 American Society for Testing and Materials International (ASTM)  
.1 ASTM C 208-[95(2001)], Specification for Cellulosic Fiber Insulating Board.  
.2 ASTM C 591-[01], Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.  
.3 ASTM C 612-[04], Standard Specification for Mineral Fibre Block and Board Thermal Insulation.  
.4 ASTM C 726-[05], Standard Specification for Mineral Fiber Roof Insulation Board.  
.5 ASTM C 728-[05], Standard Specification for Perlite Thermal Insulation Board.  
.6 ASTM C 1126-[04], Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.  
.7 ASTM C 1289-[05a], Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.  
.8 ASTM E 96/E 96M-[05], Standard Test Methods for Water Vapour Transmission of Materials.  
.2 Canadian Gas Association (CGA)  
.1 CAN/CGA-B149.1-[05], Natural Gas and Propane Installation Code Handbook.  
.2 CAN/CGA-B149.2-[05], Propane Storage and Handling Code.  
.3 Canadian General Standards Board (CGSB)  
.1 CGSB 71-GP-24M-[77(R1983)], Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.  
.4 Underwriters Laboratories of Canada (ULC)  
.1 CAN/ULC-S604-[M91], Standard for Type A Chimneys.  
.2 CAN/ULC-S701-[05], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.  
.3 CAN/ULC-S702-[97], Standard for Thermal Insulation, Mineral Fibre, for Buildings.  
.4 CAN/ULC-S704-[03], Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.  
.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)  
.1 Material Safety Data Sheets (MSDS).
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS .1 Product Data:  
.1 Submit manufacturer's printed product literature,



- specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.
- .3 Submit sample of insulation - 12" x 12" (300 mm x 300 mm) and mechanical fastener (each type) in accordance with Section 01 33 00 - Submittal Procedures. Include manufacturer's printed literature, specifications application recommendation by insulation manufacturer, bearing manufacturer's engineering department review stamp and comments.

#### 1.4 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

#### 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal plastic corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

### PART 2 - PRODUCTS

#### 2.1 RIGID INSULATION – BELOW GRADE FOUNDATION, WALL AND UNDERSLAB INSULATION

- .1 Extruded polystyrene (XPS) to CAN/ULC-S701. Expanded polystyrene shall not be used
- .1 Type: 4.
- .2 Compressive strength: 30 psi.
- .3 Water absorption: not more than 0.70% by volume.
- .4 Water vapour permeance: 0.75 perms
- .5 Tensile Strength: 50 psi
- .6 Shear Strength: 35 psi
- .7 Flexural Strength: 50 psi
- .8 Thickness: as indicated on drawings.
- .9 Size: largest sizes manufactured.
- .10 Edges: shiplapped.
- .11 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against
- .1 Styrofoam SM brand insulation, by Dow Chemical

- 
- Canada Inc
- .12 Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:
- .1 Celfort 300 brand insulation, By Owens-Corning Canada Inc
- .2 Alternate(s) as approved by the Consultant at time of tender.
- 2.2 CAVITY WALL INSULATION .1 Refer to specification section 07 21 29.04 Sprayed Insulation Polyurethane Foam
- 2.3 SEMI-RIGID INSULATION .1 Semi-rigid, mineral or glass fibre board insulation with a minimum density of 3.0 lbs./cu.ft. (48.0 kg/m<sup>3</sup>) and conforming to the requirements of CAN/ULC-S702-97
- .1 Type: 2.
- .2 Density: 48 kg/m<sup>3</sup>.
- .3 Surfaces: unsurfaced.
- .4 Thickness: as indicated on drawings.
- .5 Size: Panel sizes shall be of largest practical size and as required to suit wall assemblies in thicknesses as noted on drawings.
- .6 Breather membrane for type 2: minimum permeance 300 ng/(Pa.s.m<sup>2</sup>).
- .7 Vapour barrier for type 3: maximum permeance 60 ng/(Pa.s.m<sup>2</sup>).
- .8 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against
- .1 "703/AF530" Series Insulation as manufactured by Owens-Corning Canada Inc
- .9 Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:
- .1 "Cavity Rock" as manufactured by Roxul Inc
- .2 "Cavity Wall Board CWB-30" as manufactured by Fibrex Insulations Inc
- .3 Alternate(s) as approved by the Consultant at time of tender.
- 2.4 BATT INSULATION .1 Preformed, friction fit glass or mineral fibre batt insulation conforming to the requirements of CAN/ULC-S702-97, minimum thermal resistance value of R3.8 per inch (RSI 0.58 per 25.4 mm).
- .2 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against
- .1 "Fibreglas Pink" Insulation as manufactured by Owens-Corning Canada Inc
- .2 Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:

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- .1 "Flexibatt" as manufactured by Roxul Inc.
- .2 "Sustainable Insulation Fibre Glass Building Insulation" as manufactured by CertainTeed Insulation Canada Inc.
- .3 Alternate(s) as approved by the Consultant at time of tender..

- .3 Batt sizes shall be or largest practical size and as required to suit wall assemblies and in thicknesses and/or thermal resistance value as indicated on Drawings

### 2.5 SOUND BATT ATTENUATING

- .1 Preformed, friction fit, mineral or glass fibre acoustical insulation conforming to CSA A101-M1983 and CAN/ULC-S101-M89
- .2 Minimum thickness shall be 89 mm (3-1/2") or as per drawings
- .3 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against
  - .1 Fiberglass Pink Noise Stop Blanket as manufactured by Owens Corning Canada Inc
  - .2 Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
    - .1 "Sustainable Insulation Noise Reducer Sound Attenuating Batts" as manufactured by CertainTeed Insulation Canada Inc
    - .2 Alternate(s) as approved by the Consultant at time of tender.

### 2.6 ADHESIVE

- .1 Shall be compatible with air vapour membrane and as recommended by manufacturer of insulating materials

### 2.7 ACCESSORIES

- .1 Insulation clips: impale type, perforated 2" (50 mm) x 2" (50 mm) cold rolled steel adhesive back, spindle of 0.1" (2.5 mm) diameter annealed galvanized steel, length to suit insulation, complete with 1" (25 mm) diameter self-locking type galvanized washers:
- .2 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B111.
- .3 Staples: 12 mm minimum leg.
- .4 Tape: as recommended by manufacturer.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

**3.2 WORKMANSHIP**

- .1 Install insulation after building substrate materials are dry
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B.
- .5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .6 Offset both vertical and horizontal joints in multiple layer applications.
- .7 Do not enclose insulation until it has been inspected and approved by Consultant.

**3.3 EXAMINATION**

- .1 Examine substrates and immediately inform Consultant in writing of defects.
- .2 Prior to commencement of work ensure:
  - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

**3.4 RIGID INSULATION  
INSTALLATION**

- .1 Apply adhesive to insulation board as recommended by insulation manufacturer.
- .2 Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive.
- .3 Leave insulation board joints un-bonded over line of expansion and control joints. Bond continuous 6" (150 mm) wide polyethylene strip over joint using compatible adhesive prior to application of insulation
- .4 Provide flexible insulation of equivalent thickness and thermal insulation to fit areas where application of rigid insulation is not possible to provide continuous coverage

**3.5 PERIMETER FOUNDATION  
INSULATION**

- .1 Foundation wall application: Provide insulation as indicated on the drawings and sections. Apply with adhesive and mechanical fasteners recommended by insulation manufacturer.
- .2 Under slab application: Provide insulation under the floor slab as

indicated on the drawings and sections. Lay boards on level compacted fill, tape all joints.

**3.6 CAVITY WALL INSTALLATION** .1

Refer to specification section 07 21 29.04 Sprayed Insulation Polyurethane Foam

**3.7 BATT AND BLANKET INSULATION INSTALLATION**

- .1 Install batt or roll insulations where indicated on Drawings
- .2 Fit batt between framing and press firmly into place. Butt tightly or overlap at joints, free of gaps
- .3 Insulate behind pipes, ducts, electric conduits and outlets or junction boxes. Cut insulation to fit around and behind obstructions and non-standard spaces
- .4 Do not compress insulation to fit into spaces

**3.8 SEMI-RIGID MINERAL FIBER INSULATION INSTALLATION** .1

- Except at cavity walls, install mineral or glass fiber insulation boards with insulation clip type fasteners on substrate, 2 per 24" (610 mm) x 48" (1220 mm) board minimum. Impale insulation board on insulation clips, butting all joints firmly together and secure with washers. Cut off spindles 1/8"(3 mm) beyond washer
- .2 Install mineral fiber insulation in exterior metal clad walls and cavity walls over air-vapour barrier substrate. Retain in position with adhesive or insulation clips as recommended by manufacturer

**3.9 ROOF INSULATION INSTALLATION**

- .1 Refer to division 7

**3.10 CAVITY STOPS**

- .1 Install 4" x 4" (100 mm x 100 mm) semi-rigid insulation cavity stops, full depth of cavity, at all interior and exterior corners by loose fitting, between back face of exterior cladding material and wall insulation

**3.11 FIELD QUALITY CONTROL** .1

Insulation installations shall be reviewed and approved by the Consultant prior to the installation of cladding materials

**3.12 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED REQUIREMENTS

- .1 Division 1 – General Requirements
- .2 Section 055000 – Metal Fabrications
- .3 Section 061000 – Rough Carpentry
- .4 Section 07 21 29 – Sprayed Insulation – Polyurethane Foam
- .5 Section 079200 – Joints and Sealants
- .6 Section 081100 – Metal Door and Frames

### 1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-19.13M-[M87], Sealing Compound, One Component, Elastomeric Chemical Curing.
  - .2 CAN/CGSB-19.24M-[M90], Multi-Component, Chemical Curing Sealing Compound.
  - .3 CGSB 19-GP-14M-[84], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .2 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.
- .3 Drawing Reference
  - .1 Where drawings refer to “wall air-vapour barrier”, “air-vapour barrier” it shall mean Air Barrier as described by this section.

### 1.3 DESIGN INTENT

- .1 The work of this section forms a critical element of the building envelope air-vapour barrier. The Air Barrier and Spray Foam insulation will work together to create a continuous barrier for the migration of air and interior vapour from the exterior environment.
- .2 The air barrier as described in this section will work with the building spray-foam insulation as described in Section 072129.03 to create a continuous air-vapour barrier to the building envelope. Detailed coordination between this trade and the work of the spray foam contractor is required to achieve the required continuous air-vapour barrier.
- .3 Work of this section and work of Air Barrier section 07 27 00 shall be performed by the same contractor.
- .4 Air barriers shall be installed to provide transitions between all dissimilar building materials that make up the building envelope, in preparation for the installation of the wall spray foam insulation. These air barriers will also create the backing material for the spray foam at expansion gaps in the building (refer to details)
  - .1 Locations for air barrier installations shall include, but is not

limited to, the following:

- .1 Wall (concrete block and gypsum board) to top of foundation wall, prior to installation of thru wall flashing.
- .2 Wall concrete, concrete block, gypsum board to other wall substrate.
- .3 Expansion joints at floor levels at exterior wall. See typical wall section.
- .4 Steel penetrating the exterior wall assembly.
- .5 Wall to parapet transition strip
- .6 Wall to cladding systems (Insulated Metal Panel)
- .7 Wall to steel deck for exterior canopies.
- .8 Wall to Window
- .9 Wall to Curtain Wall
- .10 Wall to hollow metal door frame
- .11 Wall to steel plate overhead door frame
- .12 Wall to mechanical louver
- .13 All penetrations thru the line of the air-vapour barrier in the exterior wall assembly, including but not limited to structural, mechanical and electrical penetrations.
- .14 etc.

#### 1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .1 Provide drawings of all special joint and transition conditions.
- .4 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control
  - .1 Existing Substrate Condition: report deviations, as described in PART 3 -EXAMINATION in writing to Consultant
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

#### 1.5 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Applicator: company specializing in performing work of this section with minimum 3 years documented experience with installation of air/vapour barrier systems.

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- .2 Mock-Up:
    - .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
    - .2 Construct typical exterior wall panel, 3 m long by 3 m wide, incorporating window frame and sill , insulation, building corner condition and junction with roof system; illustrating materials interface and seals.
    - .3 Locate where directed.
    - .4 Mock-up may remain as part of finished work.
    - .5 Allow [48] hours for inspection of mock-up by Consultant before proceeding with air/vapour barrier Work.
  
- 1.6 DELIVERY, STORAGE AND HANDLING
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Clean spills and leave area as it was prior to spill.
  
- 1.7 WASTE MANAGEMENT AND DISPOSAL
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Place materials defined as hazardous or toxic waste in designated containers.
  - .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
  
- 1.8 AMBIENT CONDITIONS
  - .1 Install solvent curing sealants and vapour release adhesive materials in open spaces with ventilation.
  - .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
  - .3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.
  
- 1.9 SEQUENCING
  - .1 Sequence work in accordance with Section 01 32 16 - Construction Progress Schedule
  - .2 Sequence work to permit installation of materials in conjunction with related materials and seals.
  
- 1.10 GENERAL
  - .1 Be responsible for supervising and coordinating related Sections and assure that a fully continuous barrier will be constructed to prevent air and vapour in and ex-filtration through exterior walls, soffits, roof, and other components separating heated spaces from unheated ones



- .2 Use barrier materials which can be installed to withstand differential air pressures resulting from specified environmental conditions inside the building, and OBC defined maximum design wind loads on the exterior of the building
- .3 Seal effectively all joints between adjoining barriers and at all penetrations through them

#### 1.11 WARRANTY

- .1 For sealant and sheet materials the 12 months warranty period prescribed in the contract is extended to [24] months.
- .2 Warranty: include coverage of installed sealant and sheet materials which:
  - .1 Fail to achieve air tight and watertight seal.
  - .2 Exhibit loss of adhesion or cohesion.
  - .3 Do not cure.

### PART 2 - PRODUCTS

#### 2.1 SUSTAINABLE REQUIREMENTS

- .1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

#### 2.2 SHEET MATERIALS

- .1 Air-Vapour Barrier membrane: A sheet applied, self-adhered type air and vapour barrier membrane. Product shall have the following physical properties.
  - .1 Thickness: 0.0394" (40 mils)\
  - .2 Air leakage: 0.0001 CFM/ft2@ 1.6 lbs/ft2 to ASTM E283 and no change in air leakage when tested at 62.8 lbs/ft2 to ASTM E330-90
  - .3 Vapour permeance: 0.05 perms to ASTM E96
  - .4 Low temperature flexibility: Pass @ -22 deg. F to CGSB 37-GP-56M
  - .5 Elongation: 200% min. to ASTM D412
  - .6 Complete with flexible, base sheet compatible, flexible membrane transition sheet.
  - .7 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against
    - .1 Blueskin SA (or YG as may be required for cold weather applications) by Monsey Bakor, Inc
  - .8 Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:
    - .1 Sealtight Air Shield by W.R. Meadows
    - .2 Aquabarrier AVB by IKO
    - .3 Alternate(s) as approved by the Consultant at time of tender.

- .2 Sheet Membrane Primer: Primer as recommended by and supplied by membrane manufacturer.
- .3 Foam Seal Type [4] : spray-applied medium density spray polyurethane foam insulation/air/vapour barrier.
- .4 Sheet Seal Type [6] : butyl, black colour, 2 mm thick.

### 2.3 THROUGH-WALL FLASHING

- .1 Through-wall flashing membrane, a SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film, having the following physical properties:
  - .1 Thickness: 40 mils
  - .2 Film Thickness: 9.0 mils
  - .3 Puncture Resistance: 40lbf to ASTM E154
  - .4 Tensile Strength (film): 34500 kPa (5000 psi) ASTN D882
  - .5 Tear Resistance: 13 lbs. to ASTM D1004
  - .6 Low temperature flexibility: -22 deg. F to CGSB 37-GP-56M.
  - .7 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against
    - .1 Blueskin TWF by Monsey Bakor, Inc
  - .8 Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:
    - .1 Aquabarrier TWF by IKO
    - .2 Alternate(s) approved by the Consultant

### 2.4 SEALANTS

- .1 Sealants in accordance with Section 07 92 10 - Joint Sealing.
- .2 Primer: recommended by sealant manufacturer, appropriate to application.
- .3 Substrate Cleaner: non-corrosive type recommended by sealant manufacturer, compatible with adjacent materials.

### 2.5 ADHESIVES

- .1 Mastic Adhesive Type [1] : compatible with sheet seal and substrate, thick mastic of uniform knife grade consistency.
- .2 Adhesive Type [2] : compatible with sheet seal and substrate, permanently non-curing.

### 2.6 ACCESSORIES

- .1 Thinner and cleaner: as recommended by sheet material manufacturer.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage

and installation instructions, and datasheets.

### 3.2 GENERAL

- .1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.
- .2 Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

### 3.3 EXAMINATION

- .1 Verify that surfaces and conditions are ready to accept work of this section.
- .2 Ensure surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer's requirements.
- .3 Report unsatisfactory conditions to Consultant in writing.
- .4 Do not start work until deficiencies have been corrected.
  - .1 Beginning of Work implies acceptance of conditions.

### 3.4 PREPARATION

- .1 Remove loose or foreign matter, which might impair adhesion of materials.
- .2 Ensure substrates are clean of oil or excess dust; masonry joints struck flush, and open joints filled; and concrete surfaces free of large voids, spalled areas or sharp protrusions.
- .3 Ensure substrates are free of surface moisture prior to application of self-adhesive membrane and primer.
- .4 Ensure metal closures are free of sharp edges and burrs.
- .5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

### 3.5 INSTALLATION

- .1 Install materials in accordance with manufacturer's instructions.
- .2 Air Barrier
  - .1 Position membrane for alignment and remove protective film. Press firmly into place. Ensure minimum 75 mm overlap at all end and side laps. Promptly roll all laps with a counter top roller to effect seal. When installed horizontally, do so in a single fashion.
  - .2 Provide flexible transition strips to seal wall membrane to all:
    - .1 Window frames
    - .2 Curtain wall frames
    - .3 Door frames
    - .4 Transition strips to roof construction
    - .5 Exterior louvers

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- .6 Across structural members
- .7 Across floor construction
- .8 Mechanical and Electrical penetrations thru wall
- .9 And junction of all dissimilar materials
- .3 Cut membrane neatly around ties to form a tight seal. Seal area around ties and any projections with application of sealer
- .4 Inspect sheets for continuity. Repair punctures and tears effectively before work is concealed
- .5 Membrane shall be rolled with hard steel or polypropylene hand roller to ensure full contact with primer
- .6 Apply sealant within recommended application temperature ranges

### 3.6 FIELD QUALITY CONTROL

- .1 Notify Consultant when this section of work is complete. Work must be reviewed prior to covering with any cladding

### 3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

### 3.8 PROTECTION OF WORK

- .1 Protect finished work in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Do not permit adjacent work to damage work of this section.
- .3 Ensure finished work is protected from climatic conditions.

END OF SECTION

PART 1 - GENERAL1.1 RELATED REQUIREMENTS

- .1 Division 1 – General Requirements
- .2 Section 05 41 00 – Structural Metal Stud Framing
- .3 Section 07 21 13 – Board Insulation
- .4 Section 07 21 16 – Blanket Insulation
- .5 Section 07 21 29 – Sprayed Insulation – Polyurethane Foam
- .6 Section 07 26 00 – Vapour Retarders
- .7 Section 07 27 00 – Air Barrier
- .8 Section 07 46 13 - Preformed Metal Siding
- .9 Section 07 62 00 – Sheet Metal Flashing and Trim
- .10 Section 07 92 00 – Joints and Sealants
- .11 Section 08 11 00 – Metal Doors and Frames
- .12 Section 08 44 13 - Glazed aluminum Curtain Walls
- .13 Section 08 44 26 – Structural Sealant Glazed Assemblies
- .14 Section 08 90 00 – Louvers and Vents

1.2 REFERENCES

- .1 American National Standards Institute (ANSI).
  - .1 ANSI B18.6.4-[99], Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws.
- .2 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM D 2369-[03], Test Method for Volatile Content of Coatings.
  - .2 ASTM D 2832-[92(R1999)], Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .3 ASTM D 5116-[97], Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.
  - .2 CAN/CGSB-93.2-[M91], Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use.
  - .3 CAN/CGSB-93.3-[M91], Prefinished Galvanized and Aluminum-Zinc Alloy Steel Sheet for Residential Use.
  - .4 CAN/CGSB-93.4-[92], Galvanized and Aluminum-Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
  - .5 CGSB 93.5-[92], Installation of Metal Residential Siding,

## Soffits and Fascia.

- .4 Canadian Standards Association (CSA International).
  - .1 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
- .5 Underwriters' Laboratories of Canada (ULC).
  - .1 CAN/ULC-S706-[02], Wood Fibre Thermal Insulation for Buildings.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product data: submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures
  - .1 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for caulking materials during application and curing.
- .2 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Coordinate locations of siding segments with design concept shown on the Drawings. Confirm dimensions on site with adjacent materials to be installed, especially Mechanical Louvres and Wind Load bearing metal framing. Request and obtain copies from General Contractor of shop drawings of these materials and coordinate the location of openings and feature details as indicated.
  - .3 Show adjacent materials and finishes on Shop Drawings for review by consultant
  - .4 Indicate dimensions, profiles, attachment methods, schedule of every wall elevations and soffit. Include all trim and closure pieces, soffits, fascia, metal furring, and related work.
- .3 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit duplicate 300mm x 300mm mm samples of siding material, of colour and profile specified.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

**1.4 QUALITY ASSURANCE**

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

**1.5 WASTE MANAGEMENT AND DISPOSAL** .1

Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

- .2 Divert used metal cut-offs from landfill by disposal removed for disposal at the nearest metal recycling facility.
- .3 Divert reusable materials for reuse at nearest used building materials facility.
- .4 Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.

**PART 2 - PRODUCTS****2.1 PREFINISHED METAL SIDING AND COMPONENTS** .1

**Metal Siding (MS1)** Prefinished Aluminum Plank Cladding: to CGSB 93.4.

- .1 Profile: Match Existing
- .2 Thickness: 1/2" extruded aluminum
- .3 Installation direction: See elevations, sections and plans
- .4 Finish coating: Prefinished Wood Grain pattern.
- .5 Colour: Wood Grain – Match Existing
- .6 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against.
  - .1 Longboard, Colour and profile to match existing
- .7 **Alternate Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - .1 Aluplank
  - .2 Or approved alternate

- .2 Panel Trims: Thickness: 26 gauge
  - .1 1 1/2" thick siding: Standard and Custom trims: colour matching to each colour provided #1101 inside corners, #1104 outside corners, #1113 cap strip, #1116 drip cap, under-sill trim, starter strip and window/door trim etc. with fastener holes pre-punched.
  - .2 5/16" thick siding: Standard and Custom trims: colour matching to each colour provided #201 inside corners, #204 outside corners, #203 cap strip, #206 drip cap, under-sill trim, starter strip and window/door trim etc. with fastener holes pre-punched

**2.2 FRAMING**

- .1 Thermally Broken Z-girts, hat sections, furring, angles, clips, framing and the like are all part of the engineered assembly required for the support of the exterior cladding system. As such this framing must be designed, (spacing, gauge etc.) by the cladding engineer to meet the requirements of the material, the site, the applicable codes and regulations and bear the stamp of the professional engineer who designed it.

- .2 All framing shall meet or exceed the Z-275 galvanize standard.
- .3 Support members shall be appropriately slotted to minimize through metal conductivity.
- .4 The design provided for the supporting structure may not compromise the architectural intent as shown on the contract documents.

### 2.3 ACCESSORIES

- .1 All trim materials for a complete installation. Provide trim to all siding terminations whether specifically indicated or not. Inside corners, outside corners, cap strip, drip cap, under sill trim, starter strip and window/door trim of same material, colour and gloss as cladding, with fastener holes pre-punched.

### 2.4 FASTENERS

- .1 Screws (cladding): As supplied by siding supplier, stainless steel, hex head, self-drilling - self tapping complete with cup washer and rubber seal, prefinished and colour matched to siding. Sized to meet fastening requirements as recommended by the manufacturer.
- .2 Screws (2 piece fabricated girts): Non-corrosive self-drilling, self-tapping as recommended by metal cladding supplier of appropriate length to fasten into two piece girt system 16 mm.

### 2.5 CAULKING

- .1 Sealants: Refer to Section 07900 for appropriate sealant for this application
  - .1 Test for acceptable VOC emissions in accordance with ASTM D 2369 and ASTM D 2832.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### 3.2 INSTALLATION

- .1 Install cladding in accordance with CGSB 93.5, and manufacturer's written instructions
- .2 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.
- .3 Install outside corners, fillers and closure strips with carefully formed and profiled work.
- .4 Install soffit and fascia cladding as indicated.
- .5 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
- .6 Attach components in manner not restricting thermal movement.



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- .7 Properly seat screw rubber washers, do not underdrive or overdrive. Comply to the recommended manufacturer's installation guidelines and equipment recommendations
- .8 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00 - Joint Sealing.

### 3.3 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

**PART 1 - GENERAL****1.1 DESIGN INTENT**

- .1 Intent of specification is to provide details of existing roofing system and materials for contractor to match for roof repairs at any penetrations or connections to adjacent materials. Refer to drawings for scope of work.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C 36-[97], Standard Specification for Gypsum Board.
  - .2 ASTM C 1002-[98], Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 37-GP-54M-[1979], Roofing and Waterproofing Membrane, Sheet-Applied, Flexible, Polyvinyl Chloride.
  - .2 CGSB 37-GP-55M-[1979], Application of Sheet Applied Flexible Polyvinyl Chloride Roofing Membrane.
  - .3 CAN/CGSB-51.25-[M87], Thermal Insulation, Phenolic, Faced.
  - .4 CAN/CGSB-51.26-[M86], Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.
  - .5 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  - .6 CGSB 51-GP-38M-[76], Thermal Insulation, Cellular Glass, Pipe Covering, Block and Board.
- .3 Canadian Standards Association (CSA)
  - .1 CSA A231.1-[1972], Precast Concrete Paving Slabs.
  - .2 CAN/CSA-A247-[M86], Insulating Fibreboard.
  - .3 CSA A284-[1976], Mineral Aggregate Thermal Roof Insulation.
  - .4 CSA O121-[M1978], Douglas Fir Plywood.
  - .5 CSA O151-[M1978], Canadian Softwood Plywood.
  - .6 CAN/CSA-ISO[9001] [9002] [9003], Requirements for Quality Assurance, Parts 1, 2 and 3.
  - .7 CAN/CSA-ISO 14001-[96], Environmental Management Systems - Specifications with Guidance for Use.
- .4 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-[97], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S702-[97], Standard for Mineral Fibre Thermal Insulation for Buildings.
  - .3 CAN/ULC-S704-[98], Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.
  - .4 CAN/ULC-S706-[98], Insulated Fiberboard.

**1.3 SUBMITTALS**

- .1 Provide project specific submittals.
- .2 Shop Drawings
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate flashing, control joints, tapered insulation,

- penetrations, field fabricated seams, fastening bars and typical and job specific details.
- .3 Provide layout for tapered insulation.
- .3 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.
- .4 Compatibility declaration. See below
- .5 Product Data:
  - .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. WHMIS acceptable to Labour Canada, and Health and Welfare Canada.
  - .3 Submit product data sheets for Deck board, Vapour Barrier, Roof Insulation, Tapered Insulation and PVC membrane, Include:
    - .1 Product characteristics.
    - .2 Performance criteria.
    - .3 Limitations.

**1.4 SUBMITTALS (ALTERNATES)** .1

Alternate roofing systems: (i.e. TPO, EPDM, Mod Bid etc.) will not be accepted, or reviewed, as an equal to the specified PVC roofing system. Unsolicited bidders alternates is not an option with this tender.

- .2 Alternate PVC membrane roofing systems may be submitted for evaluation during the tender period. The following information must be submitted to the Consultant a minimum of 5 working days prior to tender closing. If the alternate product is accepted, notification will be provided via addenda.
  - .1 Sample copy of the **Roofing Membrane Manufacturer's warrantee**
  - .2 Provide a list of 5 projects installed in Northern Ontario with the proposed product which have exceeded a minimum of 10 years in place service life. List should include project name, location, installed date, and contact person with contact number.
  - .3 Applicators information including: Company name, contact information, number of years installing proposed membrane (verified by manufacturer).
  - .4 A letter from the **Roofing Membrane Manufacturer** stating their ability to recycle the roofing membrane and their commitment to provide this service once the membrane has reached its service life as per section.
  - .5 A letter from the Roofing Membrane Manufacturer indicating their commitment to provide site installation reviews as stated in this section.
  - .6 A document stating the membrane thickness as well as thickness of waterproofing layer over the scrim as per ASTM testing. For the purpose of this specification the waterproofing thickness above the scrim shall be a **minimum** of 29 mils +/- 2 mils

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Provide and maintain dry, off-ground weatherproof storage.
- .3 Store rolls of PVC flat on cross supports.
- .4 Remove only in quantities required for same day use.
- .5 Store materials in accordance with manufacturer's written instructions.
- .6 Store insulation protected from [sunlight] [and] [weather] and deleterious materials.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal, and with the Waste Reduction Work-plan.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .5 Fold up metal banding, flatten and place in designated area for recycling.
- .6 Plan and coordinate insulation work to minimize generation waste.
- .7 Collect and separate plastic and/or paper packaging for recycling.
- .8 Give preference to suppliers who take back mineral fibre insulation waste for reuse or recycling.
- .9 Use the least toxic sealants and adhesives necessary to comply with requirements of this section.
- .10 Close and seal, tightly, all partly used sealant and adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.
- .11 Place used hazardous sealant tubes and adhesive containers in areas designated for hazardous materials.
- .12 Collect, package and store PVC membrane cut-offs and waste material for recycling and return to recycler in accordance with Waste Management Plan.

**1.7 PROJECT/SITE**

- .1 Temperature, relative humidity, moisture content.

ENVIRONMENTAL  
REQUIREMENTS

- .1 Apply PVC membrane only when surfaces and ambient temperatures are within manufacturers' prescribed limits.
  - .2 Do not install PVC membrane when temperature remains below 5°C, or when wind chill gives equivalent cooling effect.
  - .3 Install PVC membrane on dry substrate, free of snow and ice. Use only dry materials and apply only during weather that will not introduce moisture into system.
- .2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

1.8 WARRANTY

- .1 Roofing Contractor Warranty – shall provide a written warrantee that the Polyvinyl Chloride Roofing and membrane flashings will stay in place and remain leak proof in accordance with G.C.24, but for a period of **Twenty-Four (24) months** from the date of Substantial Performance of the project Contract.
- .1 Warrantee repair work shall provide repairs within 24 hours of notification.

1.9 QUALITY ASSURANCE

- .1 A minimum of two members of Roofing Contractor's crew "MUST" have proof of completion (Certificate of Training) of Membrane Manufacturer's contractor training course.
- .1 There "MUST" be a minimum of two certified men on the project at all times during the installation.
- .2 Manufacturer's Technical Service Representative
- .1 A manufactures technical representative is required to provide periodic inspections of the roofing installation. This to ensure that all materials installed meet the manufactures requirements, that the installers are properly certified and the installation meets the manufacturer's requirements.
- .2 Rep shall provide copies of written reports for each visit to General Contractor and Consultant.
- .3 Roofing contractor to coordinate with manufacturers rep and coordinate for the following meetings
- .1 Roofing start up meeting prior to installation
- .2 Periodic review meetings at every 2,000 to 2,500 m2 of roof installation
- .3 Final installation/flood test/deficiency review.
- .4 Deficiency completion sign off.
- .3 Roofing contractor must be a member of Ontario Industrial Roofing Contractors Association (OIRCA), qualified and in good standing.

1.10 CONDITION OF SURFACE

- .1 Before commencing work, ensure environmental and site conditions are suitable for installation of material in accordance with manufacturer's recommendations
- .2 Assure that substrates are free of bituminous substances, smooth, clean and dry and of sufficient strength to withstand construction

traffic and equipment

- .3 Notify the Architect in writing of unsuitable surfaces and conditions
- .4 Commencement of work shall imply acceptance of surfaces and conditions

### 1.11 RECYCLING

- .1 Manufacture of roofing membrane shall provide written confirmation that they will take back the membrane once it has completed its service life. The cost to remove the membrane, package and ship it back to the manufacturers facility shall be the responsibility of the Owner.

## PART 2 - PRODUCTS

### 2.1 COMPATIBILITY

- .1 Compatibility between components of this roofing system and adjacent materials is essential. Review contract documents (drawing and specifications) for tie-ins to any and all adjacent materials and provide appropriate and compatible flashing materials. Provide a written declaration to Consultant stating that materials and components, as assembled in proposed roofing system, meet this requirement.

### 2.2 SYSTEM DESCRIPTION

Roofing System: Match existing single-ply PVC membrane roofing system complete with roof deck board, roof vapor barrier, roof insulation, tapered insulation, flashings and trims necessary and required for a complete installation.

- .1 Material: Polyvinyl-Chloride (PVC) membrane
- .2 System: Mechanically fastened
- .3 Membrane thickness: 60mils min.
- .4 Flashing thickness: 45mils (fully adhered)
- .5 Factory Mutual: FM I60 rating
- .6 **Basis of Design:** The above design parameters are based on the following product/material.
  - .1 Sarnafil

### 2.3 DECK SHEATHING

- .1 DensDeck. Non-structural, fiberglass-embedded, specially-treated gypsum core panel, to ASTM C-1177
  - .1 Thickness: 13 mm (1/2")
  - .2 Compression: 900 psi
  - .3 Size: 1220 x 2440 mm (4' x 8')
- .2 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - .1 DensDeck by Georgia Pacific
  - .2 Securock Glass Mat Roof Board By CGC
  - .3 Alternate(s) approved by the Consultant

### 2.4 VAPOUR RETARDER

- .1 Vapour retarder shall be, polyethylene LD, Permeance 1.1

Ng/Pa.S.m2 (0.02 Perms), CAN/CGSB 51.34-M86.

**2.5 ROOF INSULATION**

- .1 Polyisocyanurate foam insulation, black organic/ inorganic facers on both sides, manufactured with HCFC blowing agents, as manufactured by Atlas Roofing Corporation. Thicknesses and layers see details
  - .1 Compliance: CAN/ULC-S704
  - .2 Insulation Type: 2
  - .3 Facer Type: 4
  - .4 Board Dimensions: 1220 x2440 mm (48x96 in.)
  - .5 Compressive Strength ASTM D1621: 140kPa (20.0 psi) nominal
  - .6 Tensile Strength ASTM D1623: 600 kPa (72.5 psi)
  - .7 Water Vapour Permeance ASTM E96: 0.0 Ng/Pa.S.m2
  - .8 Dimensional Stability ASTM D2126: 0.71% max
  - .9 Water Absorption ASTM D2842: 1.2% max
  - .10 Thermal Resistance to: CAN/ULC-S770

**2.6 TAPERED INSULATION**

- .1 Tapered insulation. Polyisocyanurate foam insulation, black organic/ inorganic facers on both sides, manufactured with HCFC blowing agents, as manufactured by Atlas Roofing Corporation, or approved equal
  - .1 Compliance: CAN/ULC-S704
  - .2 Insulation Type: 2
  - .3 Facer Type: 4
  - .4 Board Dimensions: 1220 x1220 mm (48x48 in.)
  - .5 Compressive Strength ASTM D1621: 140kPa (20.0 psi) nominal
  - .6 Tensile Strength ASTM D1623: 600 kPa (72.5 psi)
  - .7 Water Vapour Permeance ASTM E96: 0.0 Ng/Pa.S.m2
  - .8 Dimensional Stability ASTM D2126: 0.71% max
  - .9 Water Absorption ASTM D2842: 1.2% max.
  - .10 Slope: 4% taper across width of board unless noted or indicated otherwise.
- .2 Tapered Perimeter: Location and slope as indicated on drawings
- .3 Crickets and diverters: Provide tapered insulation to provide crickets to high side of all curbs on roof to divert roof water around 'high' side of roof curb and slope water to drain. Provide back to back tapered insulation to provide crown in valleys to slope water to drain. See drawings for locations.
- .4 Roof Drain to be provided at all roof drains: refer to drawings for size and slope requirements.

**2.7 MEMBRANE**

- .1 PVC. Flexible polyvinyl chloride PVC sheet membrane: to CGSB 37-GP-54M.
  - .1 Colour (Top / Bottom): White / Dark Grey
    - .1 Typical to all flat roof areas.
  - .2 Class A, Type 2-reinforced,

- .3 Thickness ASTM D3083: 1.5 mm (60 mil)
- .4 Breaking Strength ASTM D751: 40.25 KN/m.
- .5 Elongation at Break ASTM D751: 20% XMD
- .6 Impact Resistance SIA 289/14: 450 mm
- .7 Low Temperature Flexibility CGSB 5.7.1: Pass at -30 deg. C
- .8 Accelerated Weathering ASTM D2565: 10,000 hr., no cracks
- .9 Linear Dimensional Change ASTM D1204: 0.1%
- .2 PVC. Flashing membrane shall be, polyvinyl chloride (PVC) membrane, non-woven glass fiber reinforced, UV resistant, and dirt repellent acrylic top coating
  - .1 Colour (Top / Bottom): White / Dark Grey
  - .2 Thickness ASTM D751: 1.5 mm (60 mils) minimum
  - .3 Tensile Strength ASTM D412: 11.0 MPa
  - .4 Elongation at Break ASTM D412: 250% XMD
  - .5 Impact Resistance SIA 280/14: 450 mm
  - .6 Low Temperature Flexibility CGSB 5.7.1: Pass at -30 deg. C.
  - .7 Accelerated Weathering ASTM D2565: 10,000 hr., no cracks
  - .8 Linear Dimensional Change ASTM D1204: 0.0%
  - .9 Compliance: CGSB 37-GP-54M79 Type 2, Class B ASTM D4434 Type 2, Grade 1
- .3 PVC resin, asphalt, rubberized asphalt, rubber and Butly compatible flexible membrane transition flashings. For use where PVC flashing is indicated to seal to materials indicated above, or other incompatible materials.
  - .1 Colour (Top / Bottom): White / Tan
  - .2 Thickness ASTM D3083: 1.5 mm (60 mils)
- .4 Pre-Manufactured PVC flashings. 60 mil (1.5mm) thick pre-manufactured, prefabricated PVC Membrane flashings, including but not limited to the following:
  - .1 Circles
  - .2 Inside Corners
  - .3 Outside Corners
  - .4 Stack Cones
  - .5 Etc.

## 2.8 FASTENING/PLATES/BARS

- .1 Fasteners, No. 15, steel, Climaseal coated, (3/4") 19mm deck penetration", for membrane securement.
- .2 Fasteners, No. 12, steel, Climaseal coated, (3/4") 19mm deck penetration", for insulation securement.
- .3 Metal insulation Plate, 3 inch (75 mm) square or round, 26 gauge stamping of SAE 1010 steel with an AZ 55 Galvalume coating.
- .4 Disk washer - , high strength linear plate used with a fastener to attach roof membrane to steel, wood or concrete roof decks. Disc washer is an 18 gauge (1.2 mm), 1 1/2" (38mm) by 3 3/4" (95mm) corrosion resistant steel plate.
- .5 Securing Bar, heavy-duty, 14 gauge, galvanized or stainless, roll-



formed steel bar used to attach membrane to roof decks. The formed steel is pre-punched with holes every 1 inch (25 mm) on center to allow various fastener spacing options.

**2.9 SEPARATION SHEET**

- .1 Woven polyolefin fabric, 100 g/m<sup>2</sup>.
- .2 Unsaturated non woven polyester felt, 400 g/m<sup>2</sup>.

**2.10 ADHESIVE AND SOLVENTS**

- .1 Solvent-based adhesive: as recommended by membrane manufacturer.
- .2 Solvent: as recommended by membrane manufacturer.

**2.11 TAPE**

- .1 Tape, isobutyl, colour grey, 3 x 25 mm (1/8 x 1 in.), as supplied by Sarnafil Ltd

**2.12 SEALERS**

- .1 Sealant: To section 07 92 00 - Joint Sealing not contain a total of volatile organic compounds in excess of 5 % by weight, asbestos-free sealant, compatible with systems materials, recommended by system manufacturer.

**2.13 WALKWAYS**

- .1 Membrane Walkway – Crossgrip Walkway grid manufactured of PVC. 915 (3'-0") wide, on sacrificial layer of PVC membrane secured to roof deck as recommended by the manufacturer. Crossgrid is a walkway that allows for water to flow under and thru the walkway and not over.
  - .1 Provide walkways to the following locations (provide a layout with shop drawings)
    - .1 Perimeter of all mechanical equipment.
    - .2 Perimeter of roof access hatch(es) & ladder(s)
    - .3 Connecting walkways to and from mechanical and access hatch perimeters.

**2.14 METAL FLASHINGS**

- .1 Prefinished, galvanized sheet steel 22 ga. (0.56 mm) to ASTM A526-80, coating designation G90 commercial, Stelcolor 10000 series.
  - .1 To profiles as indicated on the drawings, and/or as may be otherwise required.
  - .2 Allow for a minimum of Four (4) different colours of flashing to be selected by architect from manufactures full range.
- .2 PVC Flashing - polyvinyl chloride (PVC) membrane laminated metal, galvanized sheet steel, 26 ga. (0.56 mm) to ASTM A526-80, coating designation G90 commercial, dirt repellent acrylic top coating
  - .1

**2.15 FASTENERS**

- .1 Covering to steel deck: No.10 flat head, self tapping, Type S, cadmium plated screws to ASTM C 1002.

- .2 Insulation to substrate: fasteners and disks must meet Factory Mutual 4470 Standard for wind uplift and corrosion resistance.
- .3 Membrane to substrate: fasteners and spacing as recommended by manufacturer.

## 2.16 ROOF ACCESS HATCH

- .1 Roof access hatch(s). Premanufactured roof access hatches, c/w thermally broken and insulated frame c/w exterior metal surfaces.
  - .1 **Size(s)**
    - .1 915mm X 915mm, (36"x36"), standard single swing
  - .2 **Operator:** Compression spring operators to provide smooth, easy, one-hand operation. Automatic hold-open arm locks the cover in the open position to ensure safe egress.
  - .3 **Steel:** Cover and frame are 14 gauge (2 mm) G-90 paint bond galvanized steel.
  - .4 **Cover:** Brake formed, hollow-metal design with min 3" (76 mm) polyisocyanurate insulation, 3" (76 mm) beaded, overlapping flange, fully welded at corners, and internally reinforced for 40 psf (195 kg/m<sup>2</sup>) live load.
  - .5 **Curb:** 12" (305 mm) in height with integral cap flashing, min 3" (76 mm) polyisocyanurate insulation, fully welded at corners, and 5-1/2" (140 mm) mounting flange with 7/16" holes (11 mm) provided for securing frame to the roof deck
  - .6 **Gasket:** Extruded EPDM rubber gasket permanently adhered to cover
  - .7 **Hinges:** Heavy-duty pintle hinges with 3/8" (9 mm) Type 316 stainless steel hinge pins
  - .8 **Latch:** Slam latch with interior and exterior turn handles and padlock hasps
  - .9 **Lift Assistance:** Compression spring operators enclosed in telescopic tubes. Automatic hold-open arm with grip handle release
  - .10 **Performance Ratings:** Complies with UL 790 Class A (burning brand test).
  - .11 **Finish:** Steel: Alkyd base red oxide primer.
  - .12 **Hardware:** Steel: Engineered composite compression spring tubes with steel compression springs packed in grease. All other hardware is zinc plated/chromate sealed.
  - .13 **Accessories:** Safety Bar Handle. Fixed rigid exterior Hatch Rail Safety System mounted to roof hatch curb. Steel pipe PVC coated
  - .14 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - .1 'Bilco Type S-50TB' and Bil-Guard 2.0 Hatch Railing System' by Bilco Canada Ltd.
    - .2 'R-100 Ladder Access' and 'Roof Hatch Safety Rail System' by Lexcor
    - .3 Alternate(s) approved by the Consultant

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**2.17 ACCESSORIES**

- .1 Various pre-manufactured PVC flashings and trims for mechanical and electrical penetrations thru roof.
- .2 Steel termination strips, "U" shaped steel channels, PVC cord, distribution plates as recommended by membrane manufacturer.

**2.18 SOURCE QUALITY CONTROL**

- .1 Submit laboratory test reports in accordance with Section 01 45 00 - Quality Control.

**PART 3 - EXECUTION****3.1 PRE-CONSTRUCTION CONFERENCE**

- .1 The Applicator shall coordinate with the contractor, convene and attend a pre-construction conference. Attendees for the meeting shall include Owner's Representative, General Contractor, Consultant/Designer, Applicator and PVC Manufacturer(s) Representative.
- .2 The meeting shall discuss all aspects of the project including but not limited to:
  - .1 Safety
  - .2 Set up
  - .3 Construction schedule
  - .4 Contract conditions
  - .5 Coordination of the work

**3.2 SUBSTRATE EXAMINATION**

- .1 Examine and immediately inform Consultant in writing of defects.
- .2 Prior to commencement of work ensure:
  - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.
  - .2 Curbs have been built.
- .3 Drains have been installed at proper elevations relative to finished surface.
- .4 Plywood and lumber nailer plates have been installed to walls and parapets as indicated.

**3.3 PROTECTION**

- .1 Cover walls and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of work.
- .3 Dispose of rain water away from face of building until drains or hoppers installed and connected.
- .4 Protect from traffic and damage. Comply with precautions deemed necessary by Consultant.
- .5 Place plywood runways over work to enable movement of material and other traffic.

- .6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.

### 3.4 DECK SHEATHING

- .1 Place gypsum sheathing board with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.
- .2 Lay deck boards in parallel courses, butted together in moderate contact without gaps, with staggered end joints. Deck boards may require "positioning" fastening to insure no movement of board prior to application of vapour barrier.

### 3.5 VAPOUR RETARDER

- .1 Install vapour barrier loosely over deck board. Overlap all edges and seal with Tape.
- .2 Extend vapour barrier to and up all parapets. Tape and seal to transition vapour barrier on face of parapet.
- .3 Seal and tape around all penetrations through vapour retarder with approved tape and sealant.

### 3.6 EXPOSED MEMBRANE MECHANICALLY FASTENED APPLICATION

- .1 Install first layer of roof insulation board. Cut and trim insulation boards to provide plan butt joints at perimeter, parapet, curbs, etc. Lay insulation boards in parallel courses, butted together in moderate contact without gaps, with staggered end joints.
- .2 Install second layer of roof insulation boards over first layer of insulation with joints off set from underlying layer. Cut and trim insulation boards to provide plain butt joints at perimeter, parapet, curbs, etc. Lay insulation boards in parallel courses, butted together in moderate contact without gaps, with staggered end joints
- .3 Install tapered back-slope and roof sumps in locations as indicated on roof plan
- .4 Mechanically fasten insulation boards with fasteners and plates at a rate of 5 fasteners per 1200 x 1200 mm (4 x 4 ft.) board size, and 8 fasteners per 1200 x 2400 (4 x 8 ft.) board size
- .5 Unroll PVC membrane half sheets parallel with perimeter edge as per layout provided by manufacturer. Draw tight to minimize wrinkles. Overlap membrane a minimum of 150 mm (6 in.) overlap line provided on membrane. Install fasteners and membrane discs midway between 25 mm (1 in.) and 75 mm (3 in.) lines provided along edge of membrane at spacing's provided by roofing manufacturer design. Install additional rows of fasteners and membrane discs at building corners where required. Set self-drilling fasteners with torque controlled or depth locator equipment only. Hot-air weld overlaps according to manufacturers recommendation. Unroll membrane and draw tight to minimize wrinkles. Interior (field) sheets shall run perpendicular to the direction of the steel or wood

plank decks. Overlap membrane a minimum of 150 mm (6 in.) noting overlap lines provided on membrane. Install fasteners and membrane discs midway between 25 mm (1 in.) and 75 mm (3 in.) lines provided along edge of membrane at spacing provided by manufacturer. Set self-drilling fasteners with torque controlled or depth locator equipment only. Hot-air overlaps according to manufacturers' recommendation.

- .6 General: Hot-air weld all seams in strict accordance with manufacturer's printed instructions and as per instruction provided in manufacturers welding seminar
  - .1 Only manufacturer approved welding equipment is accepted for performing welds
  - .2 Welding surface must be clean and dry and free of any foreign particles. If necessary, clean welding surface with a damp cloth or white naphtha and allow 30 minutes drying time
  - .3 Prior to commencement of welding process, determine correct temperature setting and welding speed of equipment using test samples
  - .4 Machine Welding: Perform machine welding as per welding machine instructions.
    - .1 Continuously guide and supervise welding machine during entire welding process.
    - .2 Joint Overlap: Lap side and end joints minimum 75 mm (3 in.) for machine welding
    - .3 Remove membrane residue collected at nozzle with steel wire brush at least every 20 m (65 ft.) and prior to start of new seam.
    - .4 Welding speed ranges from 2.4 mm to 3 mm (8 to 10 ft.) per minute
  - .5 Hand Welding: Perform hand welding in three stages
    - .1 Tack weld overlap at 1 m (3 ft.) o.c.
    - .2 Joint Overlap: Lap side and end joints minimum 50 mm (2 in.) for hand welding
    - .3 Pre-weld back edge with continuous seam of approx. 12 mm (1/2 in.) width
    - .4 Final weld outside edge with continuous seam of approx. 25 mm (1 in.) width
    - .5 For straight laps, use a 40 mm (1-1/2 in.) wide nozzle. For corners and compound connections, use a 20 mm wide nozzle.
    - .6 Remove membrane residue collected at nozzle with steel wire brush prior to start of new seam. Welding speed ranges from 0.30 m to 0.60 m (1 to 2 ft.) per minute
- .7 Testing Welds: Check all seams for continuity after completion by use of a screwdriver. Visible evidence of good welding is smoke development during the welding process, shiny membrane surface and an uninterrupted extrusion bead of melted material from the joint
- .8 Flashing membrane: Adhere flashing membrane with adhesive to all vertical areas and flashings. Using a solvent-resistant paint roller, coat substrate with adhesive at a rate of 0.25 l/m<sup>2</sup> (0.5 gal./100 ft.<sup>2</sup>) and allow to dry minimum 1 hour. Do not apply under excessively

humid conditions or at temperatures below -10 deg C (14 deg. F). Do not coat more substrate than can be covered with membrane in one day. Unroll flashing membrane in position. Coat underside of membrane with adhesive at a rate of 0.25 l/m<sup>2</sup> (0.50 gal./100 ft.<sup>2</sup>) and allow to dry just sufficiently to produce "strings" when touched with a finger. Install membrane carefully onto the coated surfaces, press and roll solidly in. Avoid stripping lengths greater than 2m (6'-6"). Avoid any adhesive at lap area. Clean excess adhesive off with solvent.

- .9 Drain: Install drain to manufacturer's specification and requirements. Mechanically fasten drain to deck with 4 fasteners. Install low profile vandal proof strainer. Extend flashing membrane to drain opening and weld to drain flange at width of 50 mm (2 in.). Use M-J coupling for connection of drainpipe to piping system

.10 Flashings.

- .1 Install PVC membrane flashings in accordance with manufacturer's written instructions.  
.2 Prefinished: Fabricate and install flashings in accordance with CRCA specifications and details.

.11 Penetrations.

- .1 Install drain pans, vent stack covers and other penetration flashings and seal to membrane in accordance with manufacturer's recommendations and details.

- .12 Concrete Paver Walkway: Loose-lay PVC wear sheet down over roofing membrane. Cut supporting SM rigid insulation to match area of concrete paver walkway and lay over PVC wear sheet. Lay concrete pavers over insulation. Refer to drawings for configuration

### 3.7 INSPECTION AND REPAIR

- .1 Inspect completed membrane and flashings for punctures, tears and discontinuous welding seams. Apply additional layer of membrane over punctures and tears, extending min. 50 mm (2 in.) beyond damaged area in all directions and heat weld. Re-weld where necessary.

### 3.8 FIELD QUALITY CONTROL

- .1 Inspection and testing of PVC membrane application may be carried out by testing laboratory designated by Consultant.
- .2 Owner will pay for tests as specified in Section 01 29 83 - Payment Procedures: Testing Laboratory Services.
- .3 Inspection and testing of membrane application will be carried out by testing laboratory designated by Consultant.
- .4 Costs of tests will be paid under cash allowance by Owner.
- .5 Manufacturer's field Technical Representative must be present for the commencement of the installation of the roofing system. The roofing contractor must give manufacturer's representative appropriate notification of the startup date. Manufacturer's representative will conduct additional in-progress reviews at a rate of 1 per every 10,000-15,000 sq.ft of installed roof. Upon completion of the

installation and the delivery to manufacturer's representative by the Applicator of a certification that all work has been done in strict accordance with the contract specifications and manufacturer's requirements, an inspection shall be made by a Technical Representative of manufacturer to review the installed roof system. All review reports conducted by manufacturers representative will be signed by the Approved Applicator and submitted to the General Contractor and Prime Consultant

- .1 The Manufacturer's representative must perform inspections and provide written reports as required above and as listed below:
  - .1 Inspection prior to roofing commencement
  - .2 Periodic inspections throughout the course of the roofing installation but not less than once a month
  - .3 Deficiency inspection of complete roofing for deficiencies
  - .4 Final inspection to confirm all deficiencies are complete

### 3.9 FLOOD TESTING

- .1 Do not conceal waterproofing until inspection and testing are completed to satisfaction of Consultant.
- .2 Temporarily plug drains and dam horizontal surface areas to be tested and flood with water to minimum depth of 80 mm.
- .3 Maintain flooded depth for 24 hours.
- .4 If leaks occur repair and retest.
- .5 Remove water at end of test.

### 3.10 PROTECTION OF COMPLETED WORK

- .1 Ensure membrane is undamaged before application of protection board.
- .2 Apply protection board to cover membrane as required

### 3.11 ROOF ACCESS HATCH

- .1 Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
  - .1 Test units for proper function and adjust until proper operation is achieved.
  - .2 Repair finishes damaged during installation.
  - .3 Restore finishes so no evidence remains of corrective work.

Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

### 3.12 CLEANING

- .1 Clean work in accordance with Section 01 74 11 - Cleaning.
- .2 Clean to Consultant's approval, soiled surfaces, spatters, and damage caused by work of this Section.
- .3 Check drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site.

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END OF SECTION



**PART 1- GENERAL****1.1 RELATED SECTIONS**

- .1 Division 1 – General Requirements
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 07 92 00 – Joints and Sealants

**1.2 REFERENCES**

- .1 The Aluminum Association Inc. (AAI)
  - .1 AAI-Aluminum Sheet Metal Work in Building Construction-[2002].
  - .2 AAI DAF45-[03], Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A 167-[99(2004)], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM A 240/A 240M-[07e1], Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .3 ASTM A 606-[04], Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
  - .4 ASTM A 653/A 653M-[07], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .5 ASTM A 792/A 792M-[06a], Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
  - .6 ASTM B 32-[04], Standard Specification for Solder Metal.
  - .7 ASTM B 370-[03], Standard Specification for Copper Sheet and Strip for Building Construction.
  - .8 ASTM D 523-[89(1999)], Standard Test Method for Specular Gloss.
  - .9 ASTM D 822-[01(2006)], Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian Roofing Contractors Association (CRCA)
  - .1 Roofing Specifications Manual [1997].
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.
  - .2 CAN/CGSB-93.1-[M85], Sheet Aluminum Alloy, Prefinished, Residential.
- .5 Canadian Standards Association (CSA International)
  - .1 CSA A123.3-[05], Asphalt Saturated Organic Roofing Felt.
  - .2 AAMA/WDMA/CSA 101/I.S.2/A440-[2008], Standard/Specification for Windows, Doors, and Unit Skylights.
  - .3 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.

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

### 1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Shop Drawings. Show fabrication and installation layouts of all sheet metal flashing and trim, including plans, elevations, expansion-joint locations, keyed details and sections for every flashing type. Distinguish between shop- and field-assembled work.
- .4 Samples:
  - .1 Submit duplicate 6" x 6" (150 x 150 mm) samples of each type of sheet metal material, finishes and colours.
  - .2 Submit duplicate 12" (305mm) long samples of each type flashing profile.
- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures..

### 1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## PART 2 - PRODUCTS

### 2.1 ALUMINUM HEAVY FLASHING.

- .1 Aluminum-zinc alloy coated steel sheet: to ASTM A 792/A 792M, commercial quality, grade 37 with AZ180 coating, extra smooth surface.
  - .1 Thickness: 3mm
  - .2 Colour: Clear anodized

**2.2 PREFINISHED STEEL SHEET** .1

Weathering steel sheet: to ASTM A 606 high strength low alloy cold rolled architectural use grade, 1.2 mm minimum thickness.

Prefinished steel with factory applied polyvinylidene fluoride.

- .1 Class F1S.
- .2 Colour: As selected by the consultant from the FULL range. Allow for two (2) different colours, one being BLACK
- .3 Specular gloss: 30 units +/- 5 in accordance with ASTM D523-80 measured on Gardener 60 deg. glossmeter.
- .4 Coating thickness: not less than 51 micrometres. (20 mils)
- .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows:
  - .1 Outdoor exposure period 2500 hours.
  - .2 Humidity resistance exposure period 5000 hours.

**2.3 PREFINISHED ALUMINUM SHEET** .1

Aluminum sheet: proprietary utility sheet, 1.2 mm minimum thickness.

Finish: factory applied coating to CAN/CGSB-93.1 supplemented and amended as follows:

- .1 Type 1.
- .2 Class F1S.
- .3 Colour: As selected by the consultant from the FULL range. Allow for minimum five (5) different colours.
- .4 Specular gloss: 30 units.
- .5 Coating thickness: not less than 51 micrometres.
- .6 Outdoor exposure period: 8 years.
- .7 Exposure period for humidity resistance: 5000 hours.
- .8 Exposure period for salt spray resistance: 5000 hours.

- .2 Thickness specified for prefinished aluminum sheet applies to base metal.

**2.4 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Sealants: Refer to Section 079200.
- .4 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .5 Fasteners: of same material as sheet metal, to CSA B111, stainless steel, hex head, self drilling - self tapping complete with cup washer and rubber seal same as or equal to ITW Bildex, Scotts log life fasteners. Fastener length shall be suitable for metal flashing applications.
- .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .7 Touch-up paint: as recommended by prefinished material manufacturer.

**2.5 FABRICATION**

- .1 Fabricate metal flashings and other sheet metal work in accordance

with applicable CRCA 'FL' series details and as indicated.

- .2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AAI-Aluminum Sheet Metal Work in Building Construction.
- .3 Form pieces in 3048 mm minimum lengths.
  - .1 Make allowance for expansion at joints.
- .4 Hem exposed edges on underside 12 mm.
  - .1 Mitre and seal corners with sealant.
- .5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

## 2.6 METAL FLASHINGS

- .1 Form flashings, copings and fascias to profiles indicated of 0.61mm (24 Ga) thick prefinished metal.

## 2.7 REGLETS AND CAP FLASHINGS

- .1 Form recessed reglets, metal cap flashing of 0.61mm (24 Ga) thick prefinished metal for masonry work in accordance with CRCA FL series details..
  - .1 Provide slotted fixing holes and steel/plastic washer fasteners.

## 2.8 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with AA DAF45.
  - .1 Clear anodic finish
- .2 Appearance and properties of anodized finishes designated by Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative: to AAMA/WDMA/CSA-101/I.S.2/A440, for coating Classes 1, 2 and 3 respectively.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### 3.2 INSTALLATION

- .1 Install sheet metal work in accordance with CRCA FL series details, , AAI-Aluminum Sheet Metal Work in Building Construction and as detailed.
- .2 Use concealed fastenings except where approved before installation.
- .3 Lock end joints and caulk with sealant.

- .4 Install surface mounted reglets true and level, and caulk top of reglet with sealant.
- .5 Insert metal flashing into reglets to form weather tight junction.
- .6 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.
- .7 Caulk flashing at reglet with sealant.

### 3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

## PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS
- .1 Division 1 – General Requirements
  - .2 Section 06 10 00 – Rough Carpentry
  - .3 Section 09 21 16 – Gypsum Board Assemblies
  - .4 Section 09 22 16 – Non-Structural Metal Framing
  - .5 Sections 21 to 25 - Mechanical
  - .6 Sections 26 to 28 - Electrical
- 1.2 REFERENCES
- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .2 Underwriter's Laboratories of Canada (ULC)
    - .1 ULC-S115-[1995], Fire Tests of Fire stop Systems.
- 1.3 DEFINITIONS
- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
  - .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
  - .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
  - .4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.
    - .1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.
- 1.4 ACTION AND INFORMATION SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product

- characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .3 Shop Drawings/Designs:
  - .1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
  - .2 Construction details should accurately reflect actual job conditions.
  - .3 Submit manufacturer's specifications and technical data for each application and design, including the composition and limitations, documentation of ULC or cUL fire-stop system to be used and manufacturers installation instructions.
  - .4 For those fire-stop applications for which no ULC or cUL testing system is available through a manufacturer, a manufacturer's Engineering Judgement derived from similar ULC or cUL system designs or other tests must be submitted to satisfy local authorities having jurisdiction.
    - .1 Engineer judgment drawings must follow requirements set forth by the international Fire Stop Council (current version)
- .4 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control
  - .1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.
    - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
  - .4 Manufacturer's Field Reports: submit to manufacturer's written reports within [3] days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

## 1.5 DESIGN

- .1 Fire Stopping shall be designed and installed to meet the fire resistance ratings as required on the contract documents. This section shall review the contract documents and provide designs for all locations and areas to receive fire stopping in compliance with the applicable codes and regulations.
  - .1 Review drawings and submit specific, fire stopping details engineered solutions test reports for all locations required,

including, but not limited to

- .1 Wall penetrations.
- .2 Floor penetrations

- .2 Prior to beginning work of this Section submit to the Contractor and the Authorities having Jurisdiction, copies of any and all ULC Designs, or written ULC confirmation or ULC engineering studies attesting that the required fire resistance ratings required for various assemblies and components will be achieved.

## 1.6 QUALITY ASSURANCE

- .1 A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of fire-stop system to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details

## 1.7 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer and ULC markings.
- .2 Storage and Protection:
  - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
  - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN- ULC-S115 and not to exceed opening sizes for which they are intended
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115 and listed in ULC Guide No. 40 U19, or, certified by UL for use in Canada in accordance with CAN4-S115-M under service label cUL.
- .3 Service penetration fire-stop components: certified by ULC in



accordance with CAN4-S115-M85 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC, or, certified by UL for use in Canada in accordance with CAN4-S115-M under service label cUL.

- .4 Fire-resistance rating (F-rating) of installed fire stopping assembly not less than the fire-resistance rating of surrounding floor and wall assembly. Provide FT-rating for penetrations of fire walls of horizontal fire separation as determined by ULC or cUL.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables and cable trays: fire barrier pillows. Do not use cementitious or rigid seal at such locations
- .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.

## 2.2 COLOUR AND FINISH

- .1 Concealed – Where fire stopping will be concealed in the final construction, fire stopping material can be of any certified type (silicone, acrylic or other) but must be RED in colour to facilitate ease of inspection and verification.
- .2 Exposed – Where fire stopping will be exposed in the final construction, fire stopping material must be of a certified type that can accept a paint finish. Fire stopping to be installed RED in colour. Contractor to coordinate the inspection of all fire stopping prior to painting. Only upon acceptance of the installed system, may the contractor proceed with painting.
  - .1 Should a non-paintable material be provided in a location that is to receive a paint finish, the contractor shall remove the originally installed system and provide the paintable system.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

**3.2 PREPARATION**

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
  - .1 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 Coordinate with all other Divisions to ensure all clips and hangers have been installed and for inspection by Consultant prior to proceeding with fire spray to beams or underside of deck where necessary.
- .5 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

**3.3 APPLICATION**

- .1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.
- .2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide following fire resistance ratings.
- .3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.
- .4 Apply fireproofing directly to open web joists without use of expanded lath.
- .5 Tamp smooth, surfaces visible in finished work.
- .6 Apply curing compound to surface of cementations fireproofing as required by manufacturer.
- .7 Apply sealer to surface of mineral fiber fireproofing as required by manufacturer where fireproofing is to be painted and as indicated

**3.4 SEQUENCES OF OPERATION**

- .1 Proceed with installation only when submittals have been reviewed by Consultant.
- .2 Install floor fire stopping before interior partition erections.
- .3 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
- .4 Mechanical pipe insulation: certified fire stop system component.
  - .1 Ensure pipe insulation installation precedes fire stopping.

**3.5 FIELD QUALITY CONTROL**

- .1 Inspections: notify Consultant when ready for inspection and prior to

concealing or enclosing fire stopping materials and service penetration assemblies.

.2 Manufacturer's Field Services:

- .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
- .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

### 3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

### 3.7 SCHEDULE

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
  - .2 Edge of floor slabs at curtain wall and precast concrete panels.
  - .3 Top of fire-resistance rated masonry and gypsum board partitions.
  - .4 Intersection of fire-resistance rated masonry and gypsum board partitions.
  - .5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
  - .6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
  - .7 Openings and sleeves installed for future use through fire separations.
  - .8 Around mechanical and electrical assemblies penetrating fire separations whether shown or not shown on the drawings.
  - .9 Around electrical boxes larger than 129cm<sup>2</sup> in fire rated walls and ceilings in stairwells for items such as public address speakers, etc.
  - .10 Rigid ducts: greater than 129 cm<sup>2</sup> 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.

END OF SECTION

PART 1- GENERAL

- 1.1 SECTION INCLUDES .1 Materials, preparation and application for caulking and sealants.
- 1.2 RELATED SECTIONS
- .1 Division 1 – General Requirements
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .4 Section 01 45 00 - Quality Control.
- .5 Section 01 61 00 - Common Product Requirements.
- 1.3 REFERENCES
- .1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM C 919-[02], Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Canadian General Standards Board (CGSB)
- .1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
- .2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
- .4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.
- .5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.
- .3 Department of Justice Canada (Jus)
- .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 General Services Administration (GSA) - Federal Specifications (FS)
- .1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).
- .6 Transport Canada (TC)
- .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- 1.4 SUBMITTALS .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Manufacturer's product to describe.
  - .1 Caulking compound.
  - .2 Primers.
  - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Submit duplicate samples of each type of material and colour.
- .5 Cured samples of exposed sealants for each color where required to match adjacent material.
- .6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures]
  - .1 Instructions to include installation instructions for each product used.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirement].
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

#### 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal plastic, polystyrene, corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.
- .8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

- .9 Fold up metal banding, flatten, and place in designated area for recycling.

### 1.7 PROJECT CONDITIONS

- .1 Environmental Limitations:
  - .1 Do not proceed with installation of joint sealants under following conditions:
  - .2 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
  - .3 When joint substrates are wet.
- .2 Joint-Width Conditions:
  - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
  - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

### 1.8 GENERAL SCOPE DESCRIPTION

- .1 Generally provide sealants (and backer-rod) at the junction between dissimilar materials, including but not limited to the following locations:
  - .1 Expansion and control joints in masonry and junctions between masonry and other materials
  - .2 Expansion and control joints in gypsum board and junctions between gypsum board and other materials
  - .3 Joints around the perimeter of interior hollow metal and aluminum door frames and screens and adjacent construction
  - .4 Joints around the perimeter of exterior hollow metal and aluminum door frames and adjacent construction
  - .5 Joints around the perimeter of exterior windows and curtain-wall systems and adjacent construction
  - .6 Control joints in concrete floors
  - .7 Joints between countertops and walls
  - .8 Joints in ceramic tile
  - .9 Junctions of washroom fixtures to floor and wall
  - .10 Joints in vapour/air seal materials
  - .11 Joints as indicated in all details and sections to be caulked or sealed

### 1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

1.10 WARRANTY

- .1 Warrant sealant work for a total of Two Years
- .2 Warrant that surfaces shall not be stained by sealants

PART 2 - PRODUCTS2.1 SEALANT MATERIALS

- .1 Do not use caulking that emits strong odors, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which off-gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.
- .3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Primer: As recommended by sealant manufacturer for type of surface being primed and conditions of service
- .2 Vent Tubes: Rigid clear extruded plastic, min. 6 mm ID and 9 mm OD.
- .3 Sealant Colours: Colours of exposed sealants as chosen by the Consultant from manufacturers full range.
- .4 Polysulfide Two Part.
  - .1 Self-Leveling to CAN/CGSB-19.24, Type 1, Class B
- .5 Polysulfide Two Part.
  - .1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B,
- .6 Polysulfide One Part.
  - .1 Self-Leveling to CAN/CGSB-19.13, [MC-1-40-B-N]  
[MC-1-25-B-N],
- .7 Polysulfide One Part.
  - .1 Non-Sag to CAN/CGSB-19.13, [MC-2-40-B-N][MC-2-25-B-N]
- .8 Urethanes Two Part.
  - .1 Self-Leveling to CAN/CGSB-19.24, Type 1, Class B
- .9 Urethanes Two Part.
  - .1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B,
- .10 Urethanes One Part.
  - .1 Self-Leveling to CAN/CGSB-19.13, Type 1,
- .11 Urethanes One Part.
  - .1 Non-Sag to CAN/CGSB-19.13, Type 2, [MCG-2-25]  
[MCG-2-40],
- .12 Silicones One Part.
  - .1 To CAN/CGSB-19.13.
- .13 Acrylics One Part.

- .1 To CGSB 19-GP-5M.
- .14 Acrylic Latex One Part.
  - .1 To CAN/CGSB-19.17.
- .15 Acoustical Sealant.
  - .1 To [ASTM C 919].
- .16 Butyl.
  - .1 To CGSB 19-GP-14M.
- .17 Preformed Compressible and Non-Compressible back-up materials.
  - .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
    - .1 Extruded open cell foam backer rod.
    - .2 Size: oversize 30 to 50 %.
  - .2 Neoprene or Butyl Rubber.
    - .1 Round solid rod, Shore A hardness 70.
  - .3 High Density Foam.
    - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m<sup>3</sup> density, or neoprene foam backer, size as recommended by manufacturer.
  - .4 Bond Breaker Tape.
    - .1 Polyethylene bond breaker tape which will not bond to sealant.

### 2.3 SEALANT LOCATIONS

- .1 Generally provide sealants (and backer-rod) at the junction between dissimilar materials, including but not limited to the following locations:
  - .1 Expansion and control joints in masonry and junctions between masonry and other materials
  - .2 Expansion and control joints in gypsum board and junctions between gypsum board and other materials
  - .3 Joints around the perimeter of interior hollow metal and aluminum door frames and screens and adjacent construction
  - .4 Joints around the perimeter of exterior hollow metal and aluminum door frames and adjacent construction
  - .5 Joints around the perimeter of exterior windows and curtain-wall systems and adjacent construction
  - .6 Control joints in concrete floors
  - .7 Joints between countertops and walls
  - .8 Joints in ceramic tile
  - .9 Junctions of washroom fixtures to floor and wall
  - .10 Joints in vapour/air seal materials
  - .11 Joints as indicated in all details and sections to be caulked or sealed

### 2.4 JOINT CLEANER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
- .2 Primer: as recommended by manufacturer.



**PART 3 - EXECUTION****3.1 PROTECTION**

- .1 Protect installed Work of other trades from staining or contamination.

**3.2 SURFACE PREPARATION**

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

**3.3 PRIMING**

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

**3.4 BACKUP MATERIAL**

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

**3.5 MIXING**

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

**3.6 APPLICATION**

- .1 Sealant.
  - .1 Apply sealant in accordance with manufacturer's written instructions.
  - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
  - .3 Apply sealant in continuous beads.
  - .4 Apply sealant using gun with proper size nozzle.
  - .5 Use sufficient pressure to fill voids and joints solid.
  - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
  - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
  - .8 Remove excess compound promptly as work progresses and upon completion.

- .2 Curing.
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.
  - .3 Cleanup.
    - .1 Clean adjacent surfaces immediately and leave Work neat and clean.
    - .2 Remove excess and droppings, using recommended cleaners as work progresses.
    - .3 Remove masking tape after initial set of sealant.

END OF SECTION

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 07 92 10  
JOINT SEALANTS, COLOUR  
GUIDE  
Page 1 of 1

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PART 1- GENERAL

- 1.1 RELATED SECTIONS .1 Division 1 – General Requirements  
.2 Section 07 92 00 – Joint Sealants.

- 1.2 GENERAL REQUIREMENTS .1 This section is intended to provide a general description of the colours of sealants to be utilized for the project. Where no description is provided, confirm colour with Consultant

- 1.3 GENERAL SCOPE DESCRIPTION .1
- | Item   | Colour:   |
|--|---|
| .1 Exterior Windows  | Color to match base masonry                                     |
| .2 Interior Windows  | Colour to match walls   |
| .3 Junction Between Window and Sills (exterior)              | Colour to match sill  |
| .4 Junction Between Window and Sills (interior)              | Clear   |
| .5 Perimeter of interior Doors frames and Screens            | Colour to match walls   |
| .6 Door frames and Screens to floor                          | Colour to match frame   |
| .7 Perimeter of exterior Doors adjacent to Masonry or siding | Colour to match masonry or siding                               |
| .8 Flashings on Roof   | Colour to match flashings                                       |
| .9 Joints in gypsum board                                    | Colour to match wall colour                                     |
| .10 Brick Unit Masonry                                       | Colour to match masonry on exterior and wall colour on interior |
| .11 Countertops  | Colour to match wall  |
| .12 Millwork and casework to wall                            | Clear   |
| .13 Water closet to floor                                    | White   |
| .14 Urinal to wall   | White   |

END OF SECTION

PART 1- GENERAL1.1 RELATED REQUIREMENTS

- .1 Division 1 – General Requirements
- .2 Section 05 50 00 – Metal Fabrications
- .3 Section 06 10 00 – Rough Carpentry
- .4 Section 07 27 00 - Air Barrier
- .5 Section 07 62 00 – Metal Flashings and Trim
- .6 Section 07 92 00 – Joint Sealants
- .7 Section 08 71 00 – Door Hardware
- .8 Section 08 80 50 – Glazing
- .9 Section 09 91 13 – Exterior Painting
- .10 Section 09 91 23 – Interior Painting
- .11 Electrical Drawings

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A 653/A 653M-[06a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM B 29-[03], Standard Specification for Refined Lead.
  - .3 ASTM B 749-[03], Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.
  - .2 CGSB 41-GP-19Ma-[84], Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-G40.20-[04]/G40.21-[04], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CSA W59-[03], Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
  - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, [2000].
  - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, [1990].
- .5 National Fire Protection Association (NFPA)
  - .1 NFPA 80-[99], Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252-[03], Standard Methods of Fire Tests of Door

## Assemblies.

- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-[01], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S702-[97], Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  - .3 CAN/ULC-S704-[03], Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
  - .4 CAN4-S104-[M80], Standard Method for Fire Tests of Door Assemblies.
  - .5 CAN4-S105-[M85], Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.3 SYSTEM DESCRIPTION

- .1 Design Requirements:
  - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
  - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
  - .3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 NFPA 252 for ratings specified or indicated.
  - .4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with [CAN4-S104], [ASTM E 152] and [NFPA 252] and listed by nationally recognized agency having factory inspection services.
  - .5 Provide and install door grilles where indicated on the Door and Screen Schedule. Sizes and material as specified in this section.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data: in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed louvered, arrangement of hardware and fire rating and finishes.
  - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing fire rating finishes.
  - .4 Include schedule identifying each unit, with door marks and numbers matching Consultants numbering and referencing

- .5 system provide on the Contract Documents.  
Submit test and engineering data, and installation instructions.

### 1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Acceptable materials: All and only steel doors and frame products manufactured by Canadian Steel Door and Frame Manufacturer's Association (CSDFMA) members are eligible for use on this project.
- .2 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 or as indicated below..
  - .1 Interior Door Frames: 16 Ga. (.060") (1.6 mm).
  - .2 Door and frame accessories:
    - .1 Lock/strike reinforcements: 16 Ga., .060" (1.6 mm).
    - .2 Hinge reinforcements: 12 Ga., .105" (2.7 mm).
    - .3 Flush bot reinforcements: 16 Ga., .060" (1.6 mm).
    - .4 Reinforcement for surface applied hardware: 18 Ga., .048" (1.2 mm).
    - .5 Top and bottom channels: 18 Ga., .048" (1.2 mm).
    - .6 Steel top caps: 20 Ga., .036" (0.9 mm).
    - .7 Glass trim (screw fixed or snap-in types): 20 Ga., .036" (0.9 mm).
    - .8 Mortar guard boxes: 22 Ga., .030" (0.8 mm).
    - .9 Floor anchors: 16 Ga., .060" (1.6 mm).
    - .10 Wall anchors:
      - .1 Masonry strap type: 18 Ga., .048" (1.2 mm).
      - .2 Masonry wire type: .156" dia. (4.0 m dia.)
      - .3 Masonry stirrup-strap type: 16 Ga., .060" (1.6 mm).
      - .4 Steel/wood stud type: 29 Ga., .036" (0.9 mm).
      - .5 Steel/wood stud tension and associated wall type: 20 Ga. .036" (0.9 mm)..6
      - .6 Existing masonry/concrete wall type: 20 Ga., .036" (0.9 mm).
    - .11 Jamb spreaders: 20 Ga., .036" (0.9 mm).

### 2.2 ADHESIVES

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin

based, low viscosity, contact cement.

- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

### 2.3 PRIMER

- .1 Touch-up prime CAN/CGSB-1.181.

### 2.4 PAINT

- .1 Field paint steel doors and frames in accordance with Section[s] 09 91 23 - Interior Painting, 09 91 13 - Exterior Painting. Protect weather strips from paint. Provide final finish free of scratches or other blemishes.

### 2.5 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior top and bottom caps: steel.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal riveted.
- .6 Make provisions for glazing as indicated and provide necessary glazing stops.
  - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
  - .2 Design exterior glazing stops to be tamperproof.
- .7 Door Grilles. Refer to sizes and locations as indicated in the door schedule and door types drawing.
  - .1 Provide fire rated and non-fire rated door grilles, refer to door rating and provide rated grilles to all fire rated doors, including 0 hour and 0 minute rated doors.
  - .2 Grilles: Stainless Steel with brushed finish.
  - .3 Fasteners: Security Type
  - .4 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - .1 K.N. Crowder model SDL-FP and SDL-V90.
    - .2 Alternate(s) as approved by the Consultant

### 2.6 FRAMES FABRICATION GENERAL

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: welded type, thermally broken type construction.
- .4 Interior frames: welded type construction.

- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with polyurethane insulation.

## 2.7 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

## 2.8 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .7 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

## 2.9 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louver openings as indicated.
- .2 Exterior doors: Polyurethane insulated construction. Interior doors:



honeycomb core construction.

- .3 Fabricate doors with longitudinal edges locked seamed, adhesive assisted. Seams: visible, tack weld at 8" (203mm) o/c & fill with metallic paste filler and sand to a uniform smooth finish.
- .4 Blank, reinforce, drill doors and tap for mortised, template hardware and electronic hardware.
- .5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .8 Provide fire labeled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with [CAN4-S104] [ASTM E 152] [NFPA 252] and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .9 Manufacturer's nameplates on doors are not permitted.

#### 2.10 DOORS: HONEYCOMB CORE CONSTRUCTION

- .1 Exterior doors sheet steel with polyurethane core laminated under pressure to face sheets.
- .2 Interior doors sheet steel with honeycomb and temperature rise rated core laminated under pressure to face sheets.

#### 2.11 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation. Installer to use low expansion spray foam between wall and frame

### PART 3 - EXECUTION

#### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

- 3.2 INSTALLATION GENERAL
- .1 Install labeled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
  - .2 Install doors and frames to CSDMA Installation Guide.
- 3.3 FRAME INSTALLATION
- .1 Set frames plumb, square, level and at correct elevation.
  - .2 Secure anchorages and connections to adjacent construction.
  - .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
  - .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
  - .5 Caulk perimeter of frames [between frame and adjacent material].
  - .6 Maintain continuity of air barrier and vapour retarder.
- 3.4 DOOR INSTALLATION
- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 06 10 00 – Rough Carpentry.
  - .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
    - .1 Hinge side: 1.0 mm.
    - .2 Latch side and head: 1.5 mm.
    - .3 Finished floor, 13 mm.
  - .3 Adjust operable parts for correct function.
  - .4 Install louvers.
- 3.5 FINISH REPAIRS
- .1 Touch up with primer finishes damaged during installation.
  - .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.
- 3.6 GLAZING
- .1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

END OF SECTION

**PART 1 - GENERAL****1.1 RELATED SECTIONS**

- .1 Division 1 - General Requirements
- .2 Section 06 20 00 - Finish Carpentry.
- .3 Section 08 11 00 - Metal Doors and Frames.
- .4 Section 08 71 00 - Door Hardware.
- .5 Section 08 80 50 - Glazing.

**1.2 REFERENCES**

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
  - .1 Quality Standards for Architectural Woodwork 1998.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
  - .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .3 Canadian Standards Association (CSA International).
  - .1 CSA A440.2-98, Energy Performance of Windows and Other Fenestration Systems.
  - .2 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.
  - .3 CAN/CSA O132.2 Series-90(R1998), Wood Flush Doors.
  - .4 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.
  - .5 CAN/CSA-Z808-96, A Sustainable Forest Management System: Guidance Document.
  - .6 CSA Certification Program for Windows and Doors 00.
- .4 National Fire Protection Association (NFPA).
  - .1 NFPA 80-1999, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252-1999, Standard Method of Fire Tests of Door Assemblies.
- .5 Underwriters' Laboratories of Canada (ULC).
  - .1 CAN-4S104M-80(R1985), Fire Tests of Door Assemblies.
  - .2 CAN4-S105M-85 (R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

**1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
    - .1 For caulking materials during application and curing.
    - .2 For door materials and adhesives.
- .2 Shop Drawings:

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## Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 08 14 16  
FLUSH WOOD DOORS  
Page 2 of 4

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- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate door types and cutouts for lights and louvres, sizes, core construction, transom panel construction and cutouts.

### 1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit one 300 x 300 mm corner sample of each type wood door.
- .3 Show door construction, core, glazing detail and faces.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

### 1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements:
  - .1 Wood fire rated doors: labeled and listed by an organization accredited by Standards Council of Canada.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

### 1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Storage and Protection:
  - .1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.
  - .2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.
  - .3 Protect doors from scratches, handling marks and other damage. Wrap doors.
  - .4 Store doors away from direct sunlight.

### 1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.
- .3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.
- .4 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

## PART 2 - PRODUCTS

- 2.1 FIRE RATED WOOD DOORS .1 Wood doors: tested in accordance with CAN4-S104 to achieve rating as scheduled.
- 2.2 WOOD FLUSH DOORS .1 Solid core: to CAN/CSA-O132.2.1.
- .1 Solid particleboard core: stile and rail frame bonded to particleboard core with wood lock blocks and wood blocking, 5-ply construction.
    - .1 Stile edges: Consisting of 16 mm hardwood edge and solid hardwood for a total thickness of 108 mm.
    - .2 Top and bottom rails: Consisting of 57 mm hardwood laminate.
    - .3 Door thickness: 44mm.
  - .2 Face Panels:
    - .1 Grade I (Premium), Factory finish with three (3) coat clear polyurethane to both faces and all edges
      - .1 Species and Cut
        - .1 Species: **Birch**
        - .2 Cut: Flat Cut, Book Matched
      - .2 coordinate wood species and veneer cut with 06 40 00 – Architectural Woodwork
  - .3 Opening Trim:
    - .1 Provide flush wood trim with 3mm rabbet to perimeter of glazed openings in wood doors. Wood to be same species as wood door, finished same as wood door.
- .2 Adhesive: Type I (waterproof) for interior doors.
- 2.3 GLAZING .1 Glass: Refer to Schedules and Section 088000.
- 2.4 ACCESSORIES .1 Not Applicable
- 2.5 FABRICATION .1 Vertical edge strips to match face veneer.
- .2 Prepare doors for louvres and glazing. Provide hardwood species to match face veneer. Flush glazing stops with mitred corners.
  - .3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.
  - .4 Radius vertical edges of double acting doors to 60 mm radius.

## PART 3 - EXECUTION

- 3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

**3.2 INSTALLATION**

- .1 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.
- .2 Install labelled fire rated doors to NFPA 80.
- .3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.
- .4 Adjust hardware for correct function.
- .5 Install glazing in accordance with Section 08 80 50 - Glazing
- .6 Install louvres and stops.

**3.3 ADJUSTMENT**

- .1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

**3.4 CLEANING**

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking; clean doors and frames.
- .3 Clean glass and glazing materials with approved non-abrasive cleaner.
- .4 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 08 31 00  
ACCESS DOORS – MECHANICAL  
& ELECTRICAL  
Page 1 of 3

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## PART 1 - GENERAL

### 1.1 INTENT

- .1 The intent of this section is to provide the general specification for the supply of required access doors for the project.
  - .1 The coordination of all trades shall be provided by the general contractor.
  - .2 The supply of the access doors shall be by the Mechanical and Electrical trades.
  - .3 The installation of the access doors shall be by the trade in which the access door is required to be installed in.
    - .1 Mason for doors in concrete block
    - .2 Drywall trade for doors in partitions and ceilings
    - .3 Etc.
  - .4 Finishing where applicable by the finishing trades.

### 1.2 RELATED SECTION

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 01 61 00 - Common Product Requirements.
- .4 Section 01 78 00 - Closeout Submittals.
- .5 Division 9 - Finishes

### 1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.
- .3 Submit a Schedule of all the access doors, complete with
  - .1 Location of door, (room number)
  - .2 Surface type (floor, wall, ceiling)
  - .3 Surface Finish
  - .4 Fire Rating
  - .5 Type
  - .6 Size
  - .7 Finish

### 1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit one sample of each type of hand entry access door.
- .3 Submit one 300 x 300 mm corner sample of each type of body entry door.

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 08 31 00  
ACCESS DOORS – MECHANICAL  
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- 1.5 CLOSEOUT SUBMITTALS .1 Provide maintenance data for cleaning and maintenance of stainless steel finishes for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.6 WASTE MANAGEMENT AND DISPOSAL .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with the Waste Reduction Workplan.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal; paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- 1.7 DELIVERY, STORAGE AND HANDLING .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Leave protective covering on stainless steel access panels in place until final cleaning of building.

## PART 2 - PRODUCTS

- 2.1 ACCESS DOORS .1 Access Doors: to provide access in Walls, Floors and Ceilings and as may be referenced in Mechanical, Electrical and Architectural Plans and Specifications. Complete with rounded safety corners, concealed hinges, anchor straps and able to open 180.
- .1 Type: Flush Type
- .1 Drywall Type: Flush door with concealed fastening with drywall bead edge for mud and taping into adjacent drywall finish.
- .2 Concrete or Concrete block partitions: Flanged face with concealed fastening.
- .2 Provide fire rated access doors to match the rating of the assembly type they are located in.
- .3 Size
- .1 For body entry: 600 x 600 mm.
- .2 For hand entry: 300 x 300 mm.
- .3 Other sizes as may be required, none smaller than 300x300
- .4 Finish:
- .1 Drywall and Concrete: Prime coated steel for painting by Division 9
- .2 Tiled or marble surfaces and other special areas: Stainless steel with brushed satin finish
- .5 Access:
- .1 Typical: Screwdriver latch
- .2 Secure Areas: Tamper proof security screws (not keyed locks)



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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 08 31 00  
ACCESS DOORS – MECHANICAL  
& ELECTRICAL  
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- .6 **Basis of Design:** The above design parameters are based on the following product/material, which all alternates will be reviewed against
  - .1 Acudor FA-300 Retrofit
- .7 Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:
  - .1 Alternate(s) as approved by the Consultant at time of tender..

## 2.2 EXCLUSIONS

- .1 Lay-in tile ceilings: use unobtrusive identification locators.

## PART 3 - EXECUTION

### 3.1 LOCATION

- .1 Provide access doors where required for access to balancing valves, valves, splitters, electrical access, disconnects, devices, cleanouts etc.
- .2 Location: Ensure that equipment is within view and accessible for operating, inspecting, adjusting, servicing without using special tools.

END OF SECTION

**PART 1 - GENERAL****1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 78 00 - Closeout Submittals.
- .3 STRUCTURAL SPECS ON DRAWINGS
- .4 Section 06 01 00 – Rough Carpentry
- .5 Section 06 40 00 – Architectural Woodwork
- .6 Section 07 21 13 – Insulation
- .7 Section 07 26 00 – Vapour Retarders
- .8 Section 07 27 00 – Air Barriers
- .9 Section 07 21 29.03 - Sprayed Insulation - Polyurethane Foam
- .10 Section 07 92 00 - Joint Sealing: caulking of joints between frames and other building components.
- .11 Section 08 80 50 – Glazing

**1.2 REFERENCES**

- .1 Aluminum Association (AA), Designation System for Aluminum Finishes (2000)
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.40-[97], Anticorrosive Structural Steel Alkyd Primer.
  - .2 CAN/CGSB-79.1-[M91], Insect Screens.
- .3 Canadian Standards Association (CSA) International
  - .1 CSA-A440-[00]/A440.1-[00], A440-[00], Windows / Special Publication A440.1-[00], User Selection Guide to CSA Standard A440-[00], Windows.
  - .2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-Z91-[M90(R2000)], Safety Code for Window Cleaning Operations.

**1.3 SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.
- .3 Submit shop drawings, designed and stamped by a Professional

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

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ALUMINUM WINDOWS  
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Engineer licensed to practice in Ontario, showing materials, and details for head, jamb, and sill profiles of components, elevations of unit, anchorage, sealing details and design loads and deflections

- .4 Submit shop drawings for window security screens. Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates

#### 1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Include 300 mm long samples of head, jamb, sill, to indicate profile.

#### 1.5 DESIGN

- .1 Design for wind and snow loads as set out by the Ontario Building Code, current edition, and as currently amended, for the building location. Copies of any and all structural calculations made in connection with the supplementary design and/or detailing of the work of this section shall be promptly furnished to the Architect if requested
- .2 Submit with shop drawings certification that window design and construction will meet the specified requirements. Certification shall be in the form of test reports on similar units performed by an independent testing laboratory, and shall meet approval of Architect before fabrication commences
- .3 Conform to latest issue of CAN/CSA-A440 performance standards Air Leakage-Type A3, Water Leakage Type B7, Wind Resistance-Type C5.

#### 1.6 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2 The work and materials of this Section shall be under warranty in accordance with GC 12.3 of CCDC 2 - 2008, but for a period of 10 years from the date of Architect's Certificate of Substantial Completion

#### 1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Unused or damaged glazing materials are not recyclable and must

not be diverted to municipal recycling programs.

- .4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.
- .5 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Aluminum Windows shall meet the following requirements:
  - .1 2 1/4" x 6" perimeter, thermally broken, aluminum fixed glazing frame windows.
  - .2 Colour - all framing shall be Clear Anodized
  - .3 Extruded Aluminum, 6063 alloy with T5 or T6 Temper
  - .4 All windows by same manufacturer
  - .5 Meet or exceed and provide report showing compliance with the energy performance and air leakage requirements of the OBC (current edition).
  - .6 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - .1 Alumicor Shadowline 970 Series
    - .2 Alternate(s) approved by the Consultant
- .2 Materials: to CSA-A440/A440.1 supplemented as follows:
- .3 Glass: see section 08 80 50.
- .4 Exterior trim and flashing: brake formed, 3mm thick, anodized aluminum sheet metal, formed as detailed; complete with drip edge.
- .5 Isolation coating: alkali resistant bituminous paint.
- .6 Sill Flashings: custom formed, 3mm thick, anodized aluminum, bent to custom size and shape as indicated, c/w with jamb drip deflectors, chairs, anchors and joint covers. Finish to match curtain wall mullion sections where exposed. Provide 18Ga bent aluminum end dams to flashing, sealed and secured to drip flashing
  - .1 Secured to back face of curtainwall framing member with sealant and tape prior to installation of pressure plate and cap at curtainwall locations.. Verify installation method and location with consultant for first installation.
- .7 Openable Windows: Refer to Elevations for locations
  - .1 Matching window Manufacturer Standard.
  - .2 Based on Alumicor 1350 Series Vents.
  - .3 Include Flyscreens
- .8 Spray foam insulation: CFC free, polyurethane foam in place, closed cell low expansion, one component, minimum density 15kg/m3 .
  - .1 'Enerfoam' by Dow Chemical Canada
  - .2 'IPF All Weather Pro' by Rivenco Industries.

2.2 FABRICATION

- .1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40 380 g/m<sup>2</sup> zinc coating to CAN/CSA-G164.

2.3 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
  - .1 Clear anodic finish, Class II (0.01mm)

2.4 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of isolation coating:
  - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
  - .2 Concrete, mortar and masonry.
  - .3 Wood.

2.5 GLAZING

- .1 Glaze windows in accordance with CSA-A440/A440.1.

2.6 HARDWARE

- .1 Hardware: stainless steel, aluminum or white bronze sash locks and aluminum handles to provide security and permit easy operation of units.
- .2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.
- .3 Provide special keyed opening device for windows normally locked.

PART 3 - EXECUTION3.1 WINDOW INSTALLATION

- .1 Install in accordance with CSA-A440/A440.1.
- .2 Arrange components to prevent abrupt variation in colour.

3.2 SILL INSTALLATION

- .1 Install metal sills with uniform wash to exterior, level in length, straight

in alignment with plumb up-stands and faces. Use one piece lengths at each location. Where one piece lengths are not possible, use maximum available length with splices located at mullion locations, equally distributed.

- .2 Secure sills in place with anchoring devices located at ends joints of continuous sills and evenly spaced 600 mm on centre in between.
- .3 Fasten expansion joint cover plates with self tapping stainless steel screws.
- .4 Maintain 6 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.

### 3.3 CAULKING

- .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill up-stand and window-frame. Caulk butt joints in continuous sills.
- .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Consultant.

### 3.4 PROTECTION

- .1 Protect work of this section against damage by other trades until total performance of the work.
- .2 Repair damage to window framing to satisfaction of the consultant

### 3.5 CLEANING

- .1 Clean surfaces promptly after installation, exercising care to avoid damage of the protective coating (if any)
- .2 Clean all window framing, interior and exterior prior to substantial performance of the contract.

END OF SECTION

## PART 1- GENERAL

### 1.1 RELATED SECTIONS

- .1 Division 1 – General
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 08 11 00 – Metal Doors and Frames
- .4 Section 08 44 13 – Glazed Aluminum Curtain Wall
- .5 Electrical Drawings
- .6 Installation of door operators and sequencing on site with access control division to ensure proper function of exterior actuator by the hardware supplier.

### 1.2 REFERENCES

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
  - .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.
  - .2 Canadian General Standards Board (CGSB).
    - .1 CAN/CGSB-69.17-[M86(R1993)], Bored and Preassembled Locks and Latches.
    - .2 CAN/CGSB-69.18-[M90]/ANSI/BHMA A156.1-[1981], Butts and Hinges.
  - .3 CAN/CGSB-69.19-[93]/ANSI/BHMA A156.3-[1984], Exit Devices.
  - .4 CAN/CGSB-69.20-[M90]/ANSI/BHMA A156.4-[1986], Door Controls (Closers).
  - .5 CAN/CGSB-69.21-[M90]/ANSI/BHMA A156.5-[1984], Auxiliary Locks and Associated Products.
  - .6 CAN/CGSB-69.22-[M90]/ANSI/BHMA A156.6-[1986], Architectural Door Trim.
  - .7 CAN/CGSB-69.24-[M90]/ANSI/BHMA A156.8-[1982], Door Controls - Overhead Holders.
  - .8 CAN/CGSB-69.26-[96]/ANSI/BHMA A156.10-[1991], Power-operated Pedestrian Doors.
  - .9 CAN/CGSB-69.28-[M90]/ANSI/BHMA A156.12-[1986], Interconnected Locks and Latches.
  - .10 CAN/CGSB-69.29-[93]/ANSI/BHMA A156.13-[1987], Mortise Locks and Latches.
  - .11 CAN/CGSB-69.30-[93]/ANSI/BHMA A156.14-[1991], Sliding and Folding Door Hardware.
  - .12 CAN/CGSB-69.31-[M89]/ANSI/BHMA A156.15-[1981], Closer/Holder Release Device.
  - .13 CAN/CGSB-69.32-[M90]/ANSI/BHMA A156.16-[1981], Auxiliary Hardware.
  - .14 CAN/CGSB-69.33-[M90]/ANSI/BHMA A156.17-[1987], Self-closing Hinges and Pivots.

## Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
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Section 08 71 00  
DOOR HARDWARE  
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- .15 CAN/CGSB-69.34-[93]/ANSI/BHMA A156.18-[1987],  
Materials and Finishes.
- .16 CAN/CGSB-69.35-[M89]/ANSI/BHMA A156.19-[1984], Power  
Assist and Low Energy Power Operated Doors.
- .17 CAN/CGSB-69.36-[M90]/ANSI/BHMA A156.20-[1984], Strap  
and Tee Hinges and Hasps.

### .2 Codes and Standards

- .1 National Building Code of Canada
- .2 Ontario Building Code 1997
- .3 NFPA 80
- .4 BHMA Builder's Hardware Manufacturing Association
- .5 DHI Keying Systems and Nomenclature
- .6 DHI Recommended Locations for Architectural Hardware  
for Standard Hollow Metal Doors and Frames
- .7 DHI Abbreviations and Symbols

## 1.3 SUBMITTALS

### .1 Product Data:

- .1 Submit manufacturer's printed product literature,  
specifications and data sheet in accordance with Section 01  
33 00 - Submittal Procedures.

### .2 Samples:

- .1 Submit samples in accordance with Section 01 33 00 -  
Submittal Procedures.
- .2 Identify each sample by label indicating applicable  
specification paragraph number, brand name and number,  
finish and hardware package number.
- .3 After approval samples will be returned for incorporation in  
the Work.

### .3 Hardware List:

- .1 Submit contract hardware list in accordance with Section 01  
33 00 - Submittal Procedures.
- .2 Indicate specified hardware, including make, model, material,  
function, size, finish and other pertinent information.
- .3 Provide manufacturers catalogue cuts of each hardware item.

### .4 Templates

- .1 Supply 6 complete sets of hardware templates at same time  
as hardware schedules. Templates must be compatible with  
door type (wood, hollow metal, or aluminum).

### .5 Keying Schedule

- .1 The keying schedule will be prepared by the Hardware  
supplier and obtain approval from the Owner/Client, prior to  
proceeding with keying the building. Arrange for and chair a  
meetings as necessary with the Owner/Client to
- .2 Ascertain the keying requirements for the building, which  
shall be keyed to Owners master key system.
- .3 Receive input and provide suggestions on building keying
- .4 Obtain approval of final keying schedule.

### .6 Manufacturer's Instructions:

- .1 Submit manufacturer's installation instructions.



- .7 Wiring Diagrams:
  - .1 Provide riser diagrams and schematics for any electronic hardware including electronic locks, automatic door operators, push buttons, key switches, numeric key pads, power supplies, interface equipment, controlled alarmed exit devices and sentronic door closers at same time as hardware schedule.
- .8 Closeout Submittals
  - .1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

#### 1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
  - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
  - .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .2 Storage and Protection:
  - .1 Store finishing hardware in locked, clean and dry area.

#### 1.6 WASTE DISPOSAL AND MANAGEMENT

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

#### 1.7 MAINTENANCE

- .1 Extra Materials:
  - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Supply two sets of wrenches for door closers locksets and fire exit

hardware.

## 1.8 QUALITY ASSURANCE

.1 Provide all door hardware as specified in the hardware schedule. Any substitutions must be requested and approved prior to tender closing date

.2 Hardware supplier must be engaged regularly in contracting work and is staffed to expedite work. The firm shall have been furnishing hardware on similar projects in the vicinity for at least three years. The supplier must have on staff a certified Architectural Hardware Consultant or a person with equivalent qualifications to periodically inspect and direct detailing, setting, applying, and adjusting of all hardware

.3 These individuals must attend site meetings as requested by the Architect or General Contractor

## 1.9 WARRANTY

.1 Warranty against manufacturing defects from date of substantial completion as follows

.1	Door Closers	10 years
.2	Electrical Closers	2 years
.3	Automatic Operators	2 years
.4	Locksets	3 years
.5	Exit Devices	3 years
.6	O/H Stops	1 year
.7	Other Hardware	1 year
.8	Hinges	Lifetime

## PART 2 - PRODUCTS

### 2.1 HARDWARE ITEMS

.1 Use one manufacturer's products only for similar items. Hardware shall be as listed on the hardware schedule. All details including the finish, gauges, and base materials shall be adhered to. Any proposed substitution of the products specified in the hardware schedule must be made prior to tender close, detailing the exact manufacture's product numbers proposed versus the product numbers specified. Warranty values of proposed substitutions shall not modify the above

### 2.2 DOOR HARDWARE

.1 **Allegion Canada Inc.**, 1076 Lakeshore Blvd., Mississauga, Ontario, Canada:

- .1 Door Closers LCN 1000 & 4000 Series
- .2 O/H Door stop/holders GLYNN JOHNSON
- .3 Exit Devices Von-Duprin 98 Series
- .4 Hinges Ives 3 Knuckle 3CB1 Full Mortise, and 700 Continuous
- .5 Electric Strikes Von-Duprin 6000 Series
- .6 Locks, Latches Schlage ND Series Schlage B Family, Falcon X Series. Interchangeable Cores
- .7 IVES products Wall Stops
- .8 Door Operators LCN4600 Series

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## Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
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DOOR HARDWARE  
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.2 **K.N. Crowder MFG. INC.**, 2344 South Sheridan Way., Mississauga, Ontario, Canada

- .1 Weatherstrip & Door Seal Products
- .2 Thresholds
- .3 Louvers

.3 **Gallery Specialty Hardware LTD.**, 676 Petrolia Road., Toronto, Ontario, Canada:

- .1 Protective Plates
- .2 Door Pulls
- .3 Wall and Floor Stops

.4 **Camden Door Controls** Ontario

- .1 Restroom Control Kit WC-13AXSM
- .2 Universal Washroom Emergency Call Kit CX-WEC-10K2

### 2.3 MISCELLANEOUS HARDWARE

.1 **Key Cabinet Lund Equipment Co. In.**, PO Box 213 Bath., Ohio:  
.1 Key Storage System 1206-A

### 2.4 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with material through which they pass.

### 2.5 KEYING

- .1 Door locks, keyed alike in groups with a grand master and great grand master and to Owner's Master System as directed. Hardware supplier to attend meetings with consultant and owner designate and prepare detailed keying schedule in conjunction with Owner/Client.
- .2 Provide keys in duplicate for every lock in this Contract.
- .3 Provide twelve master keys for each MK or GMK group.
- .4 Stamp keying code numbers on keys and cylinders.
- .5 Provide interchangeable construction cores to all cylinders.
- .6 Install permanent interchangeable cores to cylinders upon at or near Substantial Performance of the Contract (or as directed).
- .7 Turn over keys to Owner designate as instructed by consultant

- .8 Provide Qty 15 Construction Keys and Qty 4 Construction Control Keys

### PART 3 - EXECUTION

#### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Furnish wood and metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' instructions for proper installation of each hardware component.

#### 3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
- .2 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Install key control cabinet.
- .4 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .5 Remove interchangeable construction cores locks when directed by Owner/Client or Consultant; install permanent interchangeable cores and check operation of locks, this is to be done by the Hardware Supplier.
- .6 Installation of door operators and sequencing on site with access control division to ensure proper function of exterior actuator by the hardware supplier, this is to be done by the Hardware Supplier.

#### 3.3 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to provide tight fit at contact points with frames.

#### 3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.

- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

### 3.5 DEMONSTRATION

- .1 Keying System Setup and Cabinet:; Installation of Key cabinet is by General Contractor
  - .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
  - .2 Place file keys and duplicate keys in key cabinet on their respective hooks.
  - .3 Lock key cabinet and turn over key to Owner/Client.
- .2 Maintenance Staff Briefing:
  - .1 Brief maintenance staff regarding:
    - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
    - .2 Description, use, handling, and storage of keys.
    - .3 Use, application and storage of wrenches for door closers locksets and fire exit hardware.
- .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

### 3.6 SCHEDULE

- .1 Refer to appended schedule

END OF SECTION

For the Huron-Superior Catholic District School Board  
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Section 08 71 10  
DOOR HARDWARE SCHEDULE  
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1	EA	CLASSROOM SECURTIY LOCK ND75PD - 50-210, 50-217, 60-001	626	SCH
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1	EA	STOREROOM LOCK ND80PD RHOX - 50-210, 50-217, 60-001	626	SCH
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1	EA	CLASSROOM SECURTIY LOCK ND75PD - 50-210, 50-217, 60-001	626	SCH
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1	EA	CLASSROOM SECURTIY LOCK ND75PD - 50-210, 50-217, 60-001	626	SCH
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1	EA	PASSAGE LATCH ND10S	626	SCH
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1	EA	EXIT DEVICE 98-NLOP-F	626	VON
1	EA	EXIT DEVICE 98EO	626	VON
2	EA	AUTO-EQUALIZER 4642 REG	689	LCN
1	EA	ELECTRICAL STRIKE 6300	689	VON
1	EA	DOOR CONTACT CX-MDH		ENT
1	EA	CX12+		CAM

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DOOR HARDWARE SCHEDULE  
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**ALL 120V, LOW VOLTAGE AND DEVICE BOXES TO BE PROVIDED BY ELECTRICAL DIVISION.  
INSTALLATION OF OPERATOR TO BE DONE BY THE HARDWARE SUPPLIER.**

<b>ITEM #7</b>	1 SGLE DOOR 226-1 1/3'2"x7'-0"x45 TYPE: 1 226-1	CORRIDOR TO UNIV. W/R 226 WD.SC/HM. FIRE RATED		RH
	3 EA	HINGE 5BB1 4.5X4	652	IVE
	1 EA	STOREROOM LOCK ND80PD RHOX	626	SCH
	1 EA	ELECTRICAL STRIKE VON DUPRIN 6400	689	VON
	1 EA	AUTO-EQUALIZER 4631 REG	689	LCN
	1 EA	KICK PLATE GSH-80A 8"x36"	32D	GAL
	1 EA	WALL STOP GSH-240 CONVEX	32D	GAL
	1 EA	DOOR CONTACT CX-MDH		ENT
	1 EA	TRANSFORMER CX-TRK-2450		ENT
	1 EA	AUDIBLE ALARM CX-WEC-10K2	#8	ENT
	1 EQ	RESTROOM CONTROL KIT WC-13AXSM	#8	ENT
	1 EA	DOOR SWEEP W-24S 32"	628	KNC

**ALL 120V, LOW VOLTAGE AND DEVICE BOXES TO BE PROVIDED BY ELECTRICAL DIVISION.  
INSTALLATION OF OPERATOR TO BE DONE BY THE HARDWARE SUPPLIER.**

<b>ITEM #8</b>	1 DBLE DOOR 202-1 EXISTING DOOR TO REMAIN TYPE:	CORRIDOR 225 VESTIBULE 202		RHRA/LHRA
	1 EA	PANIC HARDWARE CD9827-NLOP	626	VON
	1 EA	PANIC HARDWARE CD9827-EO	626	VON
	2 EA	MORTISE CYLINDER 20-021 X 50-210 X 50-218 X 60-001		SCH
	1 EA	RIM CYLINDER 20-001 X 50-210 X 50-217 X 60-001		SCH
<b>ITEM #9</b>	1 SGLE DOOR 201-1 EXISTING DOOR TO REMAIN TYPE:	CORRIDOR TO STORAGE ROOM 201 DOOR HANDLE REPLACEMENT ONLY		RH
	1 EA	STOREROOM LOCK ND80PD RHOX - 50-210, 50-217, 60-001	626	SCH
<b>ITEM #10</b>	1 SGLE DOOR 11-1 EXISTING DOOR TO REMAIN TYPE:	CORRIDOR TO CLASSROOM 11 DOOR HANDLE REPLACEMENT ONLY		RH
	1 EA SCH	CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001	626	
<b>ITEM #11</b>	1 SGLE DOOR 12-1 EXISTING DOOR TO REMAIN TYPE:	CORRIDOR TO CLASSROOM 12 DOOR HANDLE REPLACEMENT ONLY		RH
	1 EA SCH	CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001	626	

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**For the Huron-Superior Catholic District School Board  
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<b>ITEM #12</b>	1 SGLE DOOR 14-1	CORRIDOR TO CLASSROOM 14		RH
	EXISTING DOOR TO REMAIN	DOOR HANDLE REPLACEMENT ONLY		
	TYPE: _____			
	1 EA	CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001	626	
	SCH			
<b>ITEM #13</b>	1 SGLE DOOR 16-1	CORRIDOR TO CLASSROOM 16		RH
	EXISTING DOOR TO REMAIN	DOOR HANDLE REPLACEMENT ONLY		
	TYPE: _____			
	1 EA	CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001	626	
	SCH			
<b>ITEM #14</b>	1 SGLE DOOR 17-1	CORRIDOR TO CLASSROOM 17		LH
	EXISTING DOOR TO REMAIN	DOOR HANDLE REPLACEMENT ONLY		
	TYPE: _____			
	1 EA	CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001	626	
	SCH			
<b>ITEM #15</b>	1 SGLE DOOR 18-1	CORRIDOR TO JK/SK CLASSROOM 18		LH
	EXISTING DOOR TO REMAIN	DOOR HANDLE REPLACEMENT ONLY		
	TYPE: _____			
	1 EA	CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001	626	
	SCH			
<b>ITEM #16</b>	1 SGLE DOOR 19-1	CORRIDOR TO STAFFROOM 19		LH
	EXISTING DOOR TO REMAIN	DOOR HANDLE REPLACEMENT ONLY		
	TYPE: _____			
	1 EA	CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001	626	
	SCH			
<b>ITEM #17</b>	1 SGLE DOOR 19B-1	STAFFROOM TO STAFF WR 19B		RH
	EXISTING DOOR TO REMAIN	DOOR HANDLE REPLACEMENT ONLY		
	TYPE: _____			
	1 EA	PRIVACY LOCK ND40S	626	SCH
<b>ITEM #18</b>	1 SGLE DOOR 20-1	CORRIDOR TO OFFICE 20		LH
	EXISTING DOOR TO REMAIN	DOOR HANDLE REPLACEMENT ONLY		
	TYPE: _____			

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	1 EA CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001 SCH	626
<b>ITEM #19</b>	1 SGLE DOOR 20B-1 OFFICE TO STORAGE 20B EXISTING DOOR TO REMAIN DOOR HANDLE REPLACEMENT ONLY TYPE: _____	RH
	1 EA CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001 SCH	626
<b>ITEM #20</b>	1 SGLE DOOR 21-1 CORRIDOR TO OFFICE 21 EXISTING DOOR TO REMAIN DOOR HANDLE REPLACEMENT ONLY TYPE: _____	RH
	1 EA CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001 SCH	626
<b>ITEM #21</b>	1 SGLE DOOR 308-1 OFFICE 21 TO STORAGE/SERVER ROOM 308 EXISTING DOOR TO REMAIN DOOR HANDLE REPLACEMENT ONLY TYPE: _____	LH
	1 EA CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001 SCH	626
<b>ITEM #22</b>	1 SGLE DOOR 22B-1 LIBRARY TO AV/IT 22B EXISTING DOOR TO REMAIN DOOR HANDLE REPLACEMENT ONLY TYPE: _____	RH
	1 EA CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001 SCH	626
<b>ITEM #23</b>	1 SGLE DOOR 306-1 CLASSROOM 23 TO STORAGE 306 EXISTING DOOR TO REMAIN DOOR HANDLE REPLACEMENT ONLY TYPE: _____	LH
	1 EA CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001 SCH	626
<b>ITEM #24</b>	1 SGLE DOOR 28A CORRIDOR TO JANITOR 28A EXISTING DOOR TO REMAIN DOOR HANDLE REPLACEMENT ONLY TYPE: _____	LHR
	1 EA CLASSROOM SECURTIY LOCK ND75PD- 50-210, 50-217, 60-001 SCH	626

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**END OF SECTION**

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PART 1- GENERAL1.1 RELATED SECTIONS

- .1 Division 1 – General Requirements
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 07 92 00 – Joint Sealants
- .4 Section 08 11 00 – Metal Doors and Frames
- .5 Section 08 52 00 – Aluminum Windows

1.2 REFERENCES

- .1 American National Standards Institute (ANSI).
  - .1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .2 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C 542-94(1999), Specification for Lock-Strip Gaskets.
  - .2 ASTM D 790-02, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  - .3 ASTM D 1003-00, Test Method for Haze and Luminous Transmittance of Plastics.
  - .4 ASTM D 1929-96(R2001)e1, Test Method for Determining Ignition Temperature of Plastics.
  - .5 ASTM D 2240-02b, Test Method for Rubber Property - Durometer Hardness.
  - .6 ASTM E 84-01, Test Method for Surface Burning Characteristics of Building Materials.
  - .7 ASTM F 1233-98, Test Method for Security Glazing Materials and Systems.
- .3 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
  - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
  - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
  - .4 CAN/CGSB-12.4-M91, Heat Absorbing Glass.
  - .5 CAN/CGSB-12.5-M86, Mirrors, Silvered.
  - .6 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.
  - .7 CAN/CGSB-12.8-97, Insulating Glass Units.
  - .8 CAN/CGSB-12.9-M91, Spandrel Glass.
  - .9 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
  - .10 CAN/CGSB-12.11-M90, Wired Safety Glass.
  - .11 CAN/CGSB-12.12-M90, Plastic Safety Glazing.
  - .12 CAN/CGSB-12.13-M91, Patterned Glass.
- .4 Canadian Standards Association (CSA International).
  - .1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors.
  - .2 CSA Certification Program for Windows and Doors 2000.
- .5 Flat Glass Manufacturers Association (FGMA).
  - .1 FGMA Glazing Manual - 1997.

- .6 Laminators Safety Glass Association (LSGA).
  - .1 LSGA Laminated Glass Design Guide 2000.

### 1.3 SYSTEM DESCRIPTION

- .1 Performance Requirements:
  - .1 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
    - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
  - .2 Size glass to withstand wind loads, dead loads and positive and negative live loads as measured in accordance with ANSI/ASTM E330.
  - .3 Limit glass deflection to 1/200 with full recovery of glazing materials.

### 1.4 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 11 33 00 - Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures:
    - .1 For glazing materials during application and curing.
- .2 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit 300 x 300 mm size samples of each glazing type and thermal unit.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.
- .5 Closeout Submittals:
  - .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

### 1.5 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .1 Provide testing of glass under provisions of Section 01 45 00 - Quality Control.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 SITE CONDITIONS

- .1 Environmental Requirements:
  - .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Divert metal cut-offs from landfill by disposal at nearest metal recycling facility.
- .3 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.
- .4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.
- .5 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.
- .6 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .7 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.8 WARRANTY

- .1 Warranty mirrors against defects in silvering for a minimum of five (5) years.

PART 2 - PRODUCTS2.1 MATERIALS: FLAT GLASS

- .1 Float glass: to CAN/CGSB-12.3, Mirror glazing (selected), Glazing quality, 6mm thick.
- .2 Sheet glass: to CAN/CGSB-12.2, AA-Special selected, 6mm thick.
- .3 Tempered glass: to CAN/CGSB-12.1, transparent 1/2" (12mm) thick as indicated. Tempered Safety Glass
  - .1 **Tempered Glass – Type 1:** 6mm thick, Clear Vision Glass, No tint. Refer to Interior Elevations and Door and Screen Elevations.
- .4 **(VG1)(VG1T) Vision Glass Type 1-** Clear vision glass + Tint, 6mm thick. See elevations and schedules
  - .1 Manufacturer: As Trulite, Solarban 60 Solar Control Low-E Glass
  - .2 Colour: to be selected from range available with SunGuard (2) Silver 20 + SOLARBAN (3) 60 Clear

- .3 **Alternate Manufacturers:** Alternates similar in colour and meeting the performance characters of the thermal unit may also be used from the following manufacturers

- .1 PPG
- .2 AGC
- .3 Pilkington
- .4 Alternate(s) as approved by the Consultant at time of tender.

- .5 **(SP1) (SP1T) Spandrel Glass.** To be part of full 25mm thermal units with Outboard Glass to match **VG1** above and opacifier coat applied to surface 4. (6mm Outboard, 12mm Spacer & 6mm Inboard as per specifications noted below)

- .1 Opacifier Manufacturer: Prelco
- .2 Series: Opaci-Coat 300, Silicone Coated Spandrel Glass
- .3 Colour: Color to be 0-1860 Light White, or selected from manufacturer's full range.
- .4 **Alternate Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
  - .1 Other Alternates as approved by the consultant during time of Tender.

## 2.2 MATERIALS: SEALED INSULATING GLASS

- .1 Insulating glass units: to CAN/CGSB-12.8, double glazed unit, 25 mm overall thickness.
- .2 Glass thickness: 6 mm each light refer to elevations and schedules for glazing configurations.
- .3 Inter-cavity space thickness: 12 mm with low conductivity spacers.
- .4 Glass coating: surface number 3, low "E".
- .5 Inert gas fill: Argon
- .6 SHGC – Solar Heat Gain Coefficient for all vision glass thermal panels shall be minimum 0.53.
- .7 Glazing Schedule: Refer to elevation drawings and provide glazing to meet requirements stated there.

## 2.3 MATERIALS

- .1 Sealant Compound: CAN/CGSB-19.24-M, multi-component chemical curing, Type 2 Class A. Colour to match adjacent surfaces
- .2 Glazing Tape: 440 polyisobutylene-butyl tape manufactured by Tremco Manufacturing Co. Canada Ltd., or 3M ribbon sealer butyl tape manufactured by Minnesota Mining and Manufacturing Co.

## 2.4 ACCESSORIES

- .1 Glazing Tape: 440 polyisobutylene-butyl tape manufactured by Tremco Manufacturing Co. Canada Ltd., or 3M ribbon sealer butyl tape manufactured by Minnesota Mining and Manufacturing Co.

- .2 Gaskets: ASTM C509 cellular, elastomeric, preformed, black
- .3 Glazing Splines: Polyvinylchloride manufacturer's standard dry glazing splines to suit aluminium extrusions. Colour to match adjacent surfaces unless indicated otherwise
- .4 Spacer Shims and Setting Blocks: Neoprene, Shore "A" Durometer hardness 70-90, 100 mm long, wide enough to extend from fixed stop to opposite face of glass and of height suitable to provide adequate glazing "bite" for setting blocks. Neoprene, Shore "A" 40 to 50 Durometer hardness, of adequate thickness to provide correct glass to face clearance of at least 3 mm for spacer shims
- .5 Primer Sealers and Cleaners: To glass and plastic glazing manufacturer's standards
- .6 Breather Tubes: To manufacturer's recommendations
- .7 Setting blocks: EPDM, Shore A durometer hardness to ASTM D 2240, to suit glazing method, glass light weight and area.
- .8 Glazing clips: manufacturer's standard type.
- .9 Lock-strip gaskets: to ASTM C 542.
- .10 Mirror attachment accessories:
  - .1 Stainless steel clips.
  - .2 Mirror adhesive, chemically compatible with mirror coating and wall substrate.

### PART 3 - EXECUTION

#### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

#### 3.2 EXAMINATION

- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

#### 3.3 PREPARATION

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

#### 3.4 INSTALLATION: EXTERIOR - DRY METHOD (PREFORMED

- .1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association - Standards Manual for glazing

GLAZING)

installation methods.

- .2 Conform to recommendation of Glazing Manual 1990, Flat Glass Marketing Association, except as specified herein
- .3 Cut glazing spline to length; install on glazing light. Seal corners by butting spline and sealing junctions with sealant.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- .6 Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- .7 Trim protruding tape edge.

3.5 INSTALLATION: EXTERIOR  
WET/DRY METHOD (PREFORMED  
TAPE AND SEALANT)

- .1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association - Standards Manual for glazing installation methods
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape flush with sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 INSTALLATION: EXTERIOR -  
WET METHOD (SEALANT AND  
SEALANT)

- .1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association - Standards Manual for glazing installation methods.
- .2 Place setting blocks at 1/4 points and install glazing light or unit.

- .3 Install removable stops with glazing centred in space by inserting spacer shims both sides at 600 mm intervals, 6 mm below sight line.
- .4 Fill gaps between glazing and stops with sealant to depth of bite on glazing, maximum 9 mm below sight line to ensure full contact with glazing and continue air and vapour seal.
- .5 Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### 3.7 INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)

- .1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association - Standards Manual for glazing installation methods
- .2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .5 Place glazing tape on free perimeter of glazing in same manner described.
- .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7 Knife trim protruding tape.

### 3.8 INSTALLATION: MIRRORS

- .1 Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.
- .2 Set mirrors with clips. Anchor rigidly to wall construction.
- .3 Set in frame.
- .4 Place plumb and level.

### 3.9 INSTALLATION: PLASTIC FILM

- .1 Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
- .2 Place without air bubbles, creases or visible distortion.
- .3 Fit tight to glass perimeter with razor cut edge.

### 3.10 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking.



- .3 Remove glazing materials from finish surfaces.
- .4 Remove labels after work is complete.
- .5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions.
- .6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

### 3.11 PROTECTION OF FINISHED WORK .1

After installation, mark light with an "X" by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units

END OF SECTION

PART 1- GENERAL1.1 RELATED SECTIONS

- .1 Division 1 – General Requirements
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 07 84 00 – Fire Stopping
- .4 Section 07 92 00 – Joint Sealants
- .5 Section 08 11 00 – Metal Doors and Frames
- .6 Section 09 22 16 – Non-Structural Metal Framing.
- .7 Section 09 91 23 – Interior Painting

1.2 REFERENCES

- .1 Aluminum Association
  - .1 Designation for Aluminum Finishes-[1997].
- .2 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C 36/C 36M-[01], Specification for Gypsum Wallboard.
  - .2 ASTM C 79/C 79M-[01], Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.
  - .3 ASTM C 442/C 442M-[01], Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.
  - .4 ASTM C 475-[01], Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .5 ASTM C 514-[01], Specification for Nails for the Application of Gypsum Board.
  - .6 ASTM C 557-[99], Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
  - .7 ASTM C 630/C 630M-[01], Specification for Water-Resistant Gypsum Backing Board.
  - .8 ASTM C 840-[01], Specification for Application and Finishing of Gypsum Board.
  - .9 ASTM C 931/C 931M-[01], Specification for Exterior Gypsum Soffit Board.
  - .10 ASTM C 954-[00], Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
  - .11 ASTM C 960/C 960M-[01], Specification for Pre-decorated Gypsum Board.
  - .12 ASTM C 1002-[01], Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - .13 ASTM C 1047-[99], Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - .14 ASTM C 1280-[99], Specification for Application of Gypsum Sheathing Board.
  - .15 ASTM C 1177-[01], Specification for Glass Mat Gypsum

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## Barrier Free Upgrades Our Lady of Fatima Catholic School

For the Huron-Superior Catholic District School Board  
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- .16 Substrate for Use as Sheathing.  
ASTM C 1178/C 1178M-[01], Specification for Glass Mat Water-Resistant Gypsum Backing Board.
    - .3 Association of the Wall and Ceilings Industries International (AWEI)
    - .4 Canadian General Standards Board (CGSB)
      - .1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
      - .2 CAN/CGSB-71.25-[M88], Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
    - .5 Underwriters' Laboratories of Canada (ULC)
      - .1 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.
- 1.3 DELIVERY, STORAGE AND HANDLING
  - .1 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.
  - .2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.
  - .3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.
- 1.4 SITE ENVIRONMENTAL REQUIREMENTS
  - .1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.
  - .2 Apply board and joint treatment to dry, frost free surfaces.
  - .3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.
- 1.5 SAMPLES
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit 300 x 300 mm size samples of each board and 300 mm long samples of corner and casing beads, expansion joint.
- 1.6 WASTE MANAGEMENT AND DISPOSAL
  - .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal packaging material for recycling in

accordance with Waste Management Plan.

- .4 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Consultant.
- .5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.
- .6 Divert unused wood materials from landfill to recycling facility approved by Consultant.
- .7 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Consultant.
- .8 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Standard board: to ASTM C 36/C 36M regular, and Type X, to thickness indicated, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
- .2 Gypsum sheathing board: to ASTM C 79/C 79M, regular, and Type X, to thickness indicated, 1200 mm wide x maximum practical length.
- .3 Backing board and coreboard: to ASTM C 442/C 442M regular, and Type X, to thickness indicated, beveled edges.
- .4 Water-resistant board: to ASTM C 630/C 630M regular, and Type X, to thickness indicated, 1200 mm wide x maximum practical length.
- .5 Exterior gypsum soffit board: to ASTM C 931/C 931M to thickness indicated, 1200 mm wide x maximum practical length.
- .6 Abuse Resistant gypsum board, Medium Duty: comply with ASTM C1629 for Type X gypsum wallboard to thickness indicated, 1200 mm wide x maximum practical length.
- .7 Glass mat water-resistant gypsum backing board: to ASTM C 1178/C 1178M, to thickness indicated, 1200 mm wide x maximum practical length.
- .8 Glass mat gypsum substrate sheathing: to ASTM C 1177/C 1177M, to thickness indicated, 1200 mm wide x maximum practical length.
- .9 Exterior Grade Composite Sheathing: (Gypsum Board).
  - .1 All gypsum board products shall comply with CSA standards, 12.7 mm (1/2") exterior gypsum board
  - .1 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

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- include, but are not limited to, the following
  - .1 Dens-Glass Gold, as manufactured by Georgia Pacific Corporation
  - .2 CertainTeed Gypsum Canada Inc., GlasRoc Sheathing
  - .3 Securock Glass Mat Sheathing as manufactured by CGC
  - .4 Alternate(s) approved by the Consultant
- .2 Panels shall be in suitable width for application by maximum length with long edges tapered and ends square cut, except as indicated
- .3 Only screw fastening will be accepted. Use electro-galvanized rust resistant, power driven, self-tapping screws to CAN/CSA-A82.31-M91 M1980, with countersunk head
- .4 Length shall be minimum 1-1/4" Type S-12 and as required to suit installation unless indicated otherwise
- .5 Apply exterior grade elastomeric caulking along sheathing joints, all horizontal and vertical joints, edges and openings. Sealant equal to Sealant Type A, Section 07900- Sealants, include back up materials as required
- .6 Press contractor's tape firmly to sheathing joints, around openings, ensure a good bond
- .10 Cement board formed in a continuous process of aggregated Portland cement slurry with polymer coated, glass-fiber mesh completely encompassing edges, back and front surfaces. The edges are formed smooth. The ends are square cut.
  - .1 Meet or exceeds ANSI standards for cementations backer units (CBU). See ANSI A118.9 for test methods and specifications for CBU and ANSI A108.11 for interior installation of CBU. Exceeds industry standards as an exterior substrate for exterior finishes. Meet or exceed ASTM C1325 standard for non-asbestos fiber-mat reinforced cementations backer units
- .11 Metal furring runners, hangers, tie wires, inserts, anchors: to sizes and profiles as indicated or as required to suit project conditions, to provide adequate support and achieve final architectural requirements..
- .12 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .13 Resilient clips and drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .14 Nails: to ASTM C 514.
- .15 Steel drill screws: to ASTM C 1002.
- .16 Stud adhesive: to CAN/CGSB-71.25 ASTM C 557.
- .17 Laminating compound: as recommended by manufacturer, asbestos-free.

- .18 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, metal, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .19 Cornice cap: 12.7 mm deep x partition width, of 1.6 mm base thickness galvanized sheet steel, prime painted. Include splice plates for joints.
- .20 Shadow mold: 35 mm high, snap-on trim, of 0.6 mm base steel thickness galvanized sheet pre-finished in satin enamel, black colour.
- .21 Sealants: in accordance with Section 07 92 00 - Joint Sealing.
- .22 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealing..
- .23 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .24 Insulating strip: rubberized, moisture resistant, closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.
- .25 Joint compound: to ASTM C 475, asbestos-free.

### PART 3 - EXECUTION

#### 3.1 ERECTION

- .1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C 1280.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level and plumb to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers and grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

- .10 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across studs, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

### 3.2 APPLICATION

- .1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.
- .2 Apply single or double layer gypsum board to metal furring or framing using screw fasteners for first layer, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.
  - .1 Single-Layer Application:
    - .1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C 840.
    - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
  - .2 Double-Layer Application:
    - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
    - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
    - .3 Apply base layers at right angles to supports unless otherwise indicated.
    - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .3 Apply single or double layer gypsum board to concrete or concrete block surfaces, where indicated, using laminating adhesive.
  - .1 Comply with gypsum board manufacturer's recommendations.
  - .2 Brace or fasten gypsum board until fastening adhesive has set.
  - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 Exterior Soffits and Ceilings: Install exterior gypsum board perpendicular to supports; stagger end joints over supports. Install

with 6 mm gap where boards abut other work.

- .5 Apply water-resistant gypsum board where indicated to be applied and adjacent to slop sinks janitors closets. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .6 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.
- .7 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 609 mm.
- .8 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .9 Install gypsum board with face side out.
- .10 Do not install damaged or damp boards.
- .11 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

### 3.3 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install shadow mould at gypsum board/ceiling juncture [as indicated]. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of [preformed units] [two back-to-back casing beads] set in gypsum board facing and supported independently on both sides of joint.
- .7 Provide continuous polyethylene dust barrier behind and across control joints.
- .8 Locate control joints at approximate 10 m spacing on long corridor



runs and at approximate 15 m spacing on ceilings.

- .9 Install control joints straight and true.
- .10 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .11 Install expansion joint straight and true.
- .12 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .13 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .14 Splice corners and intersections together and secure to each member with 3 screws.
- .15 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .16 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .17 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:
  - .1 Levels of finish:
    - .1 Level 0: No tapping, finishing or accessories required.
    - .2 Level 1: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.
    - .3 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
    - .4 Level 3: Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
    - .5 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
    - .6 Level 5: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads

and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.

- .18 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .19 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .20 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .21 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .22 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .23 Mix joint compound slightly thinner than for joint taping.
- .24 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .25 Allow skim coat to dry completely.
- .26 Remove ridges by light sanding or wiping with damp cloth.
- .27 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

END OF SECTION

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

Section 09 22 16  
NON-STRUCTURAL METAL  
FRAMING  
Page 1 of 3

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## PART 1 - GENERAL

### 1.1 RELATED SECTIONS

- .1 Division 1 – General.
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 07 84 00 – Fire Stopping
- .4 Section 07 92 00 – Joint Sealants
- .5 Section 08 11 00 – Metal Doors and Frames
- .6 Section 09 21 16 – Gypsum Board Assemblies.

### 1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C 645-[00], Specification for Nonstructural Steel Framing Members.
  - .2 ASTM C 754-[00], Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-1.40-[97], Primer, Structural Steel, Oil Alkyd Type.

### 1.3 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

### 1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.
- .5 Divert unused gypsum materials from landfill to recycling facility approved by Consultant.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C 645, to sizes indicated stud size, roll formed from 0.53 or 0.91 mm thickness (to suit partition height, and deflection criteria) hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centers.
- .2 Floor track: to ASTM C 645, in widths to suit stud sizes, 32 mm flange height.
- .3 Ceiling track: to ASTM C 645, in widths to suit stud sizes, 64 mm slotted flange height.
- .4 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .5 Acoustical sealant: to CAN/CGSB – 19.21 and Section 07 92 00 Joint Sealants.
- .6 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.

## PART 3 - EXECUTION

### 3.1 ERECTION

- .1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 406 mm on centre (or closer as required by manufacturer for partition height and deflection criteria) and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .4 Erect metal studding to tolerance of 1:1000.
- .5 Attach studs to bottom deflection and/or ceiling track using screws.
- .6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .8 Provide two studs extending from floor to ceiling at each side of

openings wider than stud centers specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

- .9 Install heavy gauge single jamb studs at openings.
- .10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- .13 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .14 Extend partitions to ceiling height except where noted otherwise on drawings.
- .15 Provide 14 Ga bend steel 'Z' plates at 406 o.c. secured to underside of beams and floor decks where beam or floor is to receive spray fireproofing. Layout partitions and install plates prior to installation of spray fireproofing. See plans and details
- .16 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg slip ceiling tracks or use double track slip joint as required.
- .17 Install continuous insulating strips to isolate studs from un-insulated surfaces.
- .18 Install two continuous beads of acoustical sealant or insulating strip under studs and tracks around perimeter of sound control partitions.

### 3.2 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1- GENERAL1.1 SUMMARY

- .1 Section Includes:
  - .1 Materials and application of acoustical units for direct application or for application and installation within a suspended ceiling.

1.2 RELATED SECTIONS

- .1 Division 1 - General Requirements
- .2 Section 09 53 00.01 - Acoustical Suspension: Suspension system.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C 423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
  - .2 ASTM E 1264-98, Standard Classification for Acoustical Ceiling Products.
  - .3 ASTM E 1477-98a(2003), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
  - .4 ASTM E 119 Standard Test Method of Fire Tests of Building Construction and Material.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction and Amendment No. 1 1988.
  - .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 Underwriter's Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102-2003, Surface Burning Characteristics of Building Materials and Assemblies.

1.4 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: submit WHMIS MSDS in accordance with Section 02 81 01 - Hazardous Materials
- .3 Submit duplicate 300 x 300 samples of each type of ceiling
- .4 Submit 300mm long samples of suspension system and trim

**1.5 QUALITY ASSURANCE**

- .1 Regulatory Requirements:
  - .1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspection organization.
  - 1. Surface Burning Characteristics: As follows, tested per ASTM E84 and comply with ASTM E 1264 for Class A products. Flame Spread: 25 or less. Smoke Development: 20 or less.
  - 2. Fire Resistance Ratings: As indicated by reference to design designations in UL Fire Resistance Directory, for types of assemblies in which acoustical ceilings function as a fire protective membrane and tested as per ASTM E119.
    - 1. Protect light fixtures and airducts to comply with requirements indicated for rated assembly.

**1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Protect on site stored or installed absorptive material from moisture damage.
- .2 Store extra materials required for maintenance, where directed by Consultant.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for in accordance with Section 01 74 21 - Construction /Demolition Waste Management and Disposal.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan (WMP).
- .4 Handle and dispose of hazardous materials in accordance with Regional and Municipal, regulations.

**1.7 ENVIRONMENTAL REQUIREMENTS**

- .1 Permit wet work to dry before beginning to install.
- .2 Maintain uniform minimum temperature of 15 degrees C and humidity of 20-40% before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

**1.8 EXTRA MATERIALS**

- .1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

- .2 Provide acoustical units amounting to 2% of gross ceiling area for each pattern and type required for project.
- .3 Ensure extra materials are from same production run as installed materials.
- .4 Clearly identify each type of acoustic unit, including colour and texture.
- .5 Deliver to Consultant, upon completion of the work of this section.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1.
- .2 **(s.At-4) Suspended Acoustic Tile, 2x4**
  - .1 Material: Wet-Formed Mineral Fiber
  - .2 Size: 609mm x 1218mm x 16mm thick. (24x48x5/8")
  - .3 Colour: White
  - .4 Pattern: Medium-Textured "Directional Fissured"
  - .5 Fire Rating: Firecode
  - .6 Edge: Square Lay-In
  - .7 Suspension: 15/16" Clean Room gasketed, exposed tee.
  - .8 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - .1 USG Fissured™#586, 2'x4'x5/8", Firecode, Square Edge
    - .2 Alternate(s) approved by the Consultant.
- .3 Adhesive: type recommended by acoustic unit manufacturer.
- .4 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.
- .5 Polyethylene: to CAN/CGSB-51.34, 0.15 mm thick.
- .6 Hold down clips: purpose made clips to secure tile to suspension system, approved for use in fire-rated systems.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Consultant.

### 3.2 INSTALLATION

- .1 Installation: in accordance with ASTM C636 except where specified otherwise
- .2 Install acoustical panels and tiles in ceiling suspension system.



- .3 Install fibrous acoustical media over entire area above suspended metal panels.
- .4 In fire rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

### 3.3 APPLICATION

- .1 Install patterned acoustical units parallel to building lines with edge unit not less than 50% of unit width or with directional pattern running in same direction. Refer to reflected ceiling plan.
- .2 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with molding

### 3.4 INTERFACE WITH OTHER WORK

- .1 Co-ordinate with Section 09 53 00.01 - Acoustical Suspension.
- .2 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, and sprinkler heads, to be built into acoustical ceiling components.

END OF SECTION

**PART 1- GENERAL**

<b><u>1.1 RELATED REQUIREMENTS</u></b>	.1	Division 1 – General Requirements
	.2	Section 09 51 13 – Acoustical Panel Ceilings:
<b><u>1.2 REFERENCES</u></b>	.1	American Society for Testing and Materials International (ASTM)
	.1	ASTM C 635-04, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
	.2	ASTM C 636/C 636M-06, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
	.2	Health Canada/Workplace Hazardous Materials Information System (WHMIS)
	.1	Material Safety Data Sheets (MSDS)..
<b><u>1.3 DESIGN REQUIREMENTS</u></b>	.1	Maximum deflection: 1/360th of span to ASTM C 635 deflection test.
<b><u>1.4 ACTION AND INFORMATIONAL SUBMITTALS</u></b>	.1	Provide submittals in accordance with Section 01 33 00 - Submittal Procedures
	.2	Provide samples in accordance with Section 01 33 00 - Submittal Procedures:
	.1	Submit one representative model of each type ceiling suspension system
	.2	Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.
<b><u>1.5 QUALITY ASSURANCE</u></b>	.1	Fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada
<b><u>1.6 DELIVERY, STORAGE AND HANDLING</u></b>	.1	Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
	.2	Waste Management and Disposal:
	.1	.
	.3	Waste Management and Disposal:
	.1	Separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal..

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Suspension System for Ceiling type: **SAT-2 Suspended Acoustic Tile**. Suspension system shall be Intermediate duty, standard exposed grid.
  - .1 Manufacturer: Certainteed
  - .2 Series: Classic Hook, 24mm (15/16") Exposed Tee System.
  - .3 Sizes: 24mm (15/16") face dimension on main and cross tees, c/w 24mm (15/16") corresponding 'L' shaped edge trim.
  - .4 Color: White, or selected from standard range
  - .5 **Alternate Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
    - .1 USG. Donn Brand DX 24mm Tee System.
    - .2 Armstrong Ceilings. 24mm Prelude System..
    - .3 Rockfon. Chicago Metallic 200 Snap Grid, 24mm Exposed.
    - .4 Alternates as approved by the Consultant.
- .2 **(S-GB)** Suspension System for Gypsum Board Ceiling Type:
  - .1 Manufacturer: Armstrong
  - .2 Series: ShortSpan, Drywall Framing System.
  - .3 Sizes: 38mm (1-1/2") face dimension.
  - .4 Surface Finish: Unpainted Steel
  - .5 **Alternate Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - .1 Alternate(s) approved by the Consultant at time of tender.
- .3 Intermediate duty system to ASTM C 635.
- .4 Basic materials for suspension system: commercial quality cold rolled steel mill finished
- .5 Suspension system: non fire rated, made up as follows:
  - .1 Two directional exposed tee bar grid
- .6 Exposed tee bar grid components: shop painted satin sheen. Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection
- .7 Hanger wire: galvanized soft annealed steel wire:
  - .1 3.6 mm diameter for access tile ceilings.
  - .2 2.6 mm diameter for other ceilings.
- .8 Hanger inserts: purpose made.
- .9 Accessories: splices, clips, wire ties, retainers and wall molding flush or reveal, to complement suspension system components, as

recommended by system manufacturer.

### PART 3 - EXECUTION

#### 3.1 MANUFACTURERS INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### 3.2 INSTALLATION

- .1 Installation: in accordance with ASTM C 636 except where specified otherwise
- .2 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.
- .3 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.
- .4 Install hangers spaced at maximum 1200 mm centers and within 150 mm from ends of main tees.
- .5 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter, with border units not less than 50% of standard unit width and/or system according to reflected ceiling plan.
- .6 Ensure suspension system is coordinated with location of related components.
- .7 Install wall molding to provide correct ceiling height.
- .8 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.
- .9 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .10 Interlock cross member to main runner to provide rigid assembly.
- .11 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .12 Finished ceiling system to be square with adjoining walls and level within 1:1000.

#### 3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Touch up scratches, abrasions, voids and other defects in painted surfaces.

END OF SECTION

**PART 1 - GENERAL****1.1 RELATED SECTIONS**

- .1 Division 1 – General Requirements
- .2 Section 07 92 00 – Joint Sealants
- .3 Section 09 30 13 – Ceramic and Porcelain Tiling

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM F 1066-[04], Standard Specification for Vinyl Composition Floor Tile.
  - .2 ASTM F 1344-[04], Standard Specification for Rubber Floor Tile.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-25.20-[95], Surface Sealer for Floors.
  - .2 CAN/CGSB-25.21-[95], Detergent-Resistant Floor Polish.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.

**1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit duplicate tile in size specified, 300 mm long base, nosing, feature strips, treads, edge strips.
- .4 Closeout Submittals:
  - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

1.5 ENVIRONMENTAL  
REQUIREMENTS

- .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees C for 48 hours before, during and for 48 hours after installation.

1.6 MAINTENANCE

- .1 Extra Materials:
- .1 Provide maintenance materials of resilient tile flooring, base and adhesive in accordance with Section 01 78 00 - Closeout Submittals.
  - .2 Provide 10 m<sup>2</sup> of each colour, pattern and type flooring material required for this project for maintenance use.
  - .3 Extra materials from same production run as installed materials.
  - .4 Identify each container of floor tile and each container of adhesive.
  - .5 Deliver to Owner/Client, upon completion of the work of this section.
  - .6 Store where directed by Owner/Client.

PART 2 - PRODUCTS2.1 MATERIALS

- .1 **(SCT-1) Solid Composite Vinyl Tile – Type 1:** Solid Vinyl Tile – Homogenous, ASTM F1700 Class 2 Type B, Flammability ASTM E 648 Class 1 >0.45 CRF, Slip Resistance ADA Compliant >0.8 COF.
- .1 **Manufacturer:** Tarkett
  - .2 **Series:** Colour Essence SR
  - .3 **Size:** 12" x 12"
  - .4 **Thickness:** 1/8"
  - .5 **Patterns:** Traditional
  - .6 **Colour(s):** to be match existing adjacent vinyl flooring
  - .7 **Manufacturers:** Subject to compliance with requirements, Alternate(s) manufacturers may be approved by the Consultant at time of tender.
- .2 **(SCT-2) Solid Composite Vinyl Tile – Type 2:** Solid Vinyl Tile – Homogenous, ASTM F1700 Class 2 Type B, Flammability ASTM E 648 Class 1 >0.45 CRF, Slip Resistance ADA Compliant >0.8 COF.
- .1 **Manufacturer:** Tarkett
  - .2 **Series:** Colour Essence SR
  - .3 **Size:** 12" x 12"
  - .4 **Thickness:** 1/8"
  - .5 **Patterns:** Traditional
  - .6 **Colour(s):** to be selected by Consultant from manufacturer's full range. To match existing adjacent
  - .7 **Manufacturers:** Subject to compliance with requirements, Alternate(s) manufacturers may be approved by the Consultant at time of tender.
- .3
- .4 **Rubber Tread:** Solid Rubber Stair Tread – Homogenous, ASTM

F1344 Class 2 laminated wear layer, ABM Hammered pattern wear layer, Aquamarine surface design,

.1 **Manufacturer:** American Biltrite

.2 **Series:** AB Pure RVP

.3 **Size:** to suit existing stair

.4 **Thickness:** 1/8"

.5 **Profile:** Pure Round or equal Slip Resistant

.6 **Patterns:** Include Carborundum Visual Indicator Strip to be colour contrasting

.7 **Colour(s):** to be selected by Consultant from manufacturer's full range.

.8 **Manufacturers:** Subject to compliance with requirements, Alternate(s) manufacturers may be approved by the Consultant at time of tender.

.5 **(RCB) Resilient Cove Base** – Type 1: continuous, top set, complete with pre-moulded end stops and external corners:

.1 **Size:** 4" High

.2 **Lengths:** Roll product cut to longest lengths possible.

.3 **Colour:** to be selected by Consultant from manufacturer's full range.

.4 **Profile:** Baseworks or equal.

.5 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

.1 Tarkett

.2 Roppe

.3 Alternate(s) approved by the Consultant

.6 **(TFT) Tactile Attention Indicator:** Product to meet Clauses 4.1.1 and 4.1.2 of ISO: 23599 "Assistive Products for Blind and Vision-Impaired Persons – Tactile Walking Surface Indicators." Cut tiles to achieve length as required. Beveled edges to create a smooth transition. Tactile walking surface indicators composed of a close-knit network of spherical caps applied perpendicular to the direction the user is walking in.

.1 **Manufacturer:** Kinesik Engineered Products Inc.

.2 **Series:** Access Tile, Surface Applied

.3 **Colour:** Selected from manufacturer's full range.

.4 **Texture:**

.1 Truncated domes with a height of 5mm

.2 Base diameter of 23mm

.3 Organized in a regular pattern with spacing of 61mm on centre

.5 **Size:** 12"x12". See drawings for length.

.6 **Thickness:** 5mm thick tile, 10mm thick to top of domes.

## 2.2 ACCESSORIES

.1 **Sub-floor filler and leveler:** 2 part latex-type filler requiring no water, as recommended by flooring manufacturer for use with their material(s) on job specific substrate(s).

.2 **Metal edge strips:** aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.3 Sealer: type recommended by flooring manufacturer.

.4 Wax: type recommended by flooring manufacturer.

### PART 3 - EXECUTION

#### 3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### 3.2 INSPECTION

.1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer.

1

#### 3.3 SUB-FLOOR TREATMENT

.1 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.3 Build up base with sub-floor filler at junction of different flooring finishes to meet the finished elevation of other finishes (eg. Porcelain Tile, and Carpet) especially at doors. Maximum slope 1:50

.4 Prime and or Seal substrate to flooring manufacturer's printed instructions.

#### 3.4 TILE APPLICATION

.1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.

.2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.3 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.

.4 Install flooring to patterning as indicated or, square grid pattern with joints aligned.

.5 As installation progresses, and after installation, roll flooring in 2 directions including resilient tile with 45 kg minimum roller to ensure full adhesion.

.6 Cut tile and fit neatly around fixed objects.



- .7 Install feature strips and floor markings where indicated. Fit joints tightly.
- .8 Install flooring in pan type floor access covers. Maintain floor pattern.
- .9 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .10 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- .11 Install metal edge strips at unprotected or exposed edges where flooring terminates.

### 3.5 BASE APPLICATION

- .1 Lay out base to keep number of joints at minimum. Base joints at maximum length available or at internal or premoulded corners.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles, minimum 300 mm each leg. Wrap around toeless base at external corners.
- .8 Install toeless type base before installation of carpet on floors.

### 3.6 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
  - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

### 3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Remove excess adhesive from floor, base and wall surfaces without damage.
- .3 Clean, seal and wax floor and base surface to flooring manufacturer's instructions. In vinyl composite tile areas, 6 coats of wax minimum. In carpeted areas clean, seal and wax base surface before carpet installation.

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**Barrier Free Upgrades Our Lady of Fatima Catholic School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

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RESILIENT TILE FLOORING  
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3.8 PROTECTION

- .1 Protect new floors from after final waxing until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation.
- .3 Use only water-based coating for linoleum.

END OF SECTION

PART 1- GENERAL1.1 SUMMARY

- .1 Section Includes:
  - .1 Material and installation of site applied paint finishes to new interior surfaces, including site painting of shop primed surfaces.

1.2 RELATED SECTIONS

- .1 Division 1 – General Requirements
- .2 STRUCTURAL DRAWINGS – GENERAL NOTES
- .3 Section 08 11 00 – Metal Doors and Frames
- .4 Section 09 21 12 - Gypsum Board Assemblies
- .5 Section 09 91 13 – Exterior Painting

1.3 REFERENCES

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33
- .2 Environmental Protection Agency (EPA)
  - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 Master Painters Institute (MPI)
  - .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 National Fire Code of Canada - 1995
- .6 Society for Protective Coatings (SSPC)
  - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
- .7 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34

1.4 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
  - .3 Apprentices: working under direct supervision of qualified

trades person in accordance with trade regulations.

- .2 Mock-Ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
    - .1 Consultant to designate three rooms in the building for mock-up use. Prepare and paint, room (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
    - .2 Mock-up will be used:
      - .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
      - .2 Repair and repaint room to the satisfaction of the Consultant.
    - .3 Allow 24 hours for inspection of mock-up before proceeding with work.
    - .4 When accepted, mock-up will demonstrate minimum standard of quality required for this work.
- .3 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements

## 1.5 SCHEDULING

- .1 Submit work schedule for various stages of painting to General Contractor and Consultant for review. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Schedule painting operations to prevent disruption of occupants.

## 1.6 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit product data and instructions for each paint and coating product to be used.
  - .2 Submit product data for the use and application of paint thinner.
  - .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Samples:
  - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  - .2 Submit 200 x 300 mm sample panels of each paint, stain, clear coating, special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards

- 
- submitted on following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm birch and cherry plywood for finishes over wood surfaces.
    - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
    - .5 10 mm plywood for finishes over wood surfaces.
  - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
  - .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
    - .1 Lead, cadmium and chromium: presence of and amounts.
    - .2 Mercury: presence of and amounts.
    - .3 Organochlorines and PCBs: presence of and amounts.
  - .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .6 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation and application instructions.
  - .7 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
    - .1 Product name, type and use.
    - .2 Manufacturer's product number.
    - .3 Colour numbers.
    - .4 MPI Environmentally Friendly classification system rating.
- 1.7 MAINTENANCE
- .1 Extra Materials:
    - .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
  - .2 Quantity: provide one four litre can of each type and colour of primer, stain and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- 1.8 DELIVERY, STORAGE AND HANDLING
- .1 Packing, Shipping, Handling and Unloading:
    - .1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.
  - .2 Acceptance at Site:
    - .1 Identify products and materials with labels indicating:

- .1 Manufacturer's name and address.
  - .2 Type of paint or coating.
  - .3 Compliance with applicable standard.
  - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
  - .1 Provide and maintain dry, temperature controlled, secure storage.
  - .2 Store materials and supplies away from heat generating devices.
  - .3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.
- .8 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .9 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan (WMP).
  - .4 Place materials defined as hazardous or toxic in designated containers.
  - .5 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, and Regional and Municipal, regulations.
  - .6 Ensure emptied containers are sealed and stored safely.
  - .7 Unused materials must be disposed of at official hazardous material collections site as approved by authorities having jurisdiction.
  - .8 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous

- products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .9 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
  - .10 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
  - .11 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
    - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
    - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
    - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
    - .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
    - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
  - .12 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
  - .13 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by organizations for verifiable re-use or re-manufacturing.

#### 1.9 WASTE MANAGEMENT AND DISPOSAL

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- .13 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by organizations for verifiable re-use or re-manufacturing.

#### 1.10 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
  - .1 Ventilate enclosed spaces in accordance with health and Safety requirements.
  - .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .3 Provide continuous ventilation for seven days after completion of application of paint.
  - .4 Coordinate use of existing ventilation system with Consultant and ensure its operation during and after application of paint as required.
  - .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless pre-approved written approval by Specifying body and product manufacturer, perform no painting when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.



- .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
- .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
- .4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
- .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
- .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
- .2 Perform painting work when maximum moisture content of the substrate is below:
  - .1 Allow new concrete and masonry to cure minimum of 28 days.
  - .2 15% for wood.
  - .3 12% for plaster and gypsum board.
- .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Additional interior application requirements:
  - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
  - .2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Consultant such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Paint materials listed in the MPI Approved Products List (APL) are

acceptable for use on this project.

- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .6 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .7 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .8 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
  - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.

## 2.2 COLOURS

- .1 Allow for a selection of colours, from manufacturer's full range of colours to be used to match adjacent finishes. All colours shall be confirmed by the Consultant.
- .2 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

## 2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Consultant for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.

- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

**2.4 GLOSS/SHEEN RATINGS**

- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category	Units @ 60 Degrees	Units @ 85 Degrees
G1 – matte finish	0 to 5	max. 10
G2 – velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces as specified and as noted on Finish Schedule

**2.5 INTERIOR PAINTING SYSTEMS**

- .1 Concrete vertical surfaces: including horizontal soffits:  
.1 INT 3.1D - Alkyd G4 finish.
- .2 Concrete horizontal surfaces: floors and stairs:  
.1 INT 3.2C - Epoxy finish.
- .3 Cementitious composition board surfaces:  
.1 INT 3.3C - Alkyd G4 finish.
- .4 Concrete masonry units: smooth and split face block and brick:  
.1 INT 4.2C - Alkyd G4 finish.
- .5 Structural steel and metal fabrications: columns, beams, joists:  
.1 INT 5.1D - Alkyd dry wall finish.
- .6 Steel - high heat: (boilers, furnaces, heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted):  
.1 INT 5.2A - Heat resistant enamel finish, maximum 205 degrees C.
- .7 Dressed lumber: including doors, door and window frames, casings, mouldings:  
.1 INT 6.3Z - Clear (2 component) polyurethane finish.
- .8 Wood paneling and casework: partitions, panels, shelving, millwork:  
.1 INT 6.3Z - Clear (2 component) polyurethane finish
- .9 Bituminous coated surfaces: cast iron pipe, concrete, etc.:  
.1 INT 10.2B - Alkyd G6 finish.

- 2.6 SOURCE QUALITY CONTROL .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
- .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
- .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
- .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

### PART 3 - EXECUTION

- 3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

- 3.2 GENERAL .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

- 3.3 EXAMINATION .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to General Contractor and Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
- .1 Stucco, plaster and gypsum board: 12%.
- .2 Concrete: 12%.
- .3 Clay and Concrete Block/Brick: 12%.
- .4 Wood: 15%

- 3.4 PREPARATION .1 Protection:
- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable

- non-staining covers or masking. If damaged, clean and restore surfaces as directed by Consultant.
  - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  - .3 Protect factory finished products and equipment.
  - .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .2 Surface Preparation:
  - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
  - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  - .3 Place "WET PAINT" signs in occupied areas as painting operations progress.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by wiping with dry clean cloth, brushing and vacuuming.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Clean following surfaces with high pressure water washing: None.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
  - .2 Apply wood filler to nail holes and cracks.
  - .3 Tint filler to match stains for stained woodwork.

- .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .8 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, blowing with clean dry compressed air and vacuum cleaning.
- .9 Prepare Block surfaces, new and existing with 2 coats of Block Filler (prior to min. 1 coat primer, 2 coats finish)
- .10 Touch up of shop primers with primer as specified.
- .11 Do not apply paint until prepared surfaces have been accepted by Consultant

### 3.5 APPLICATION

- .1 Method of application to be as approved by Consultant. Apply paint by brush, roller or (airless sprayer combined with back-rolling). Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
  - .4 Brush out immediately all runs and sags.
  - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.
- .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

### 3.6 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- .2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint fire protection piping red.
- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint natural gas piping yellow.
- .11 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

- .12 Do not paint interior transformers and substation equipment.

### 3.7 SITE TOLERANCES

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

### 3.8 FIELD QUALITY CONTROL

- .1 Interior painting and decorating work shall be inspected by a Consultant.
- .2 Painting contractor shall notify inspector a minimum of one week prior to commencement of work.
- .3 Provide minimum lighting requirements for inspection
- .4 Repair and/or repaint surfaces to the Satisfaction of the Consultant
- .5 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .6 Cooperate with inspection firm and provide access to areas of work.
- .7 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

### 3.9 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant'.



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END OF SECTION

PART 1 - GENERAL1.1 RELATED SECTIONS

- .1 Division 1 – General Requirements
- .2 Section 06 10 00 – Rough Carpentry

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM A 167-99, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM B 456-95, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
  - .3 ASTM A 653/A 653M-99, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .4 ASTM A 924/A 924M-99, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
  - .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
  - .3 CAN/CGSB-12.5-M86, Mirrors, Silvered.
  - .4 CGSB 31-GP-107Ma-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .3 Canadian Standards Association (CSA)
  - .1 CAN/CSA-B651-95, Barrier-Free Design.
  - .2 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples to be returned for inclusion into work.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout

## Submittals.

- 1.6 WASTE MANAGEMENT AND DISPOSAL .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

- 1.7 EXTRA MATERIALS .1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.
- .2 Deliver special tools to Consultant.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 For the purposes of this specification, Bobrick model numbers have been specified. Equal products manufactured by ASI, Hadrian, Fiat, Bradley, Frost or Watrous, will be accepted.
- .2 **Washroom Partition (WP)** Floor Mounted Overhead Braced, 25mm thick Powder Coated Steel, toilet and change cubicle partitions and doors. Complete with Stainless steel hardware..
- .1 **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- .1 Bradley Corporation
- .2 Alternate(s) approved by the Consultant
- .3 Doors, Panels and Pilasters shall be constructed of two sheets of panel flatness zinc-coated galvanized steel, ASTM A653 GR33, laminated under pressure to a honeycomb core for sound deadening and rigidity. Formed edges to be welded together and interlocked under tension with a roll-formed oval crown locking bar, mitered, welded and ground smooth at the corners.
- .4 Doors and panels shall be 1613mm (63.5") high and 25mm (1") thick with cover sheets not less than 0.8mm (.030").
- .5 Pilasters shall be 32mm (1.25") thick with cover sheets not less than 0.9mm (.036").
- .6 Finish. All sheet metal to be finished with high performance powder coating, baked on to provide uniform smooth protective finish.
- .7 **Colour** will be selected from **full color range** including but not limited to Premium, Solid Color, Anti-Graffiti color ranges. Allow for up to (2) Two color selections
- .8 Attachment: stainless steel tamper proof type screws and bolts.

2.2 COMPONENTS

- .1 Hardware: All panel-to-wall, panel-to-pilaster and pilaster-to-wall connections shall be made with full height continuous channels. Door hardware shall be chrome plated zinc die castings. Fasteners are zinc plated 12 x 1-3/4" and 12 x 5/8" TR-27 6-lobe security screws.
- .2 Wall and connecting brackets: stainless steel extrusion or casting.
- .3 Do not provide Coat Hooks. Bumper may not project.

2.3 COMPONENTS WASHROOM

- .1 Provide accessory items manufactured by companies as noted or approved equal
- .2 Emergency Call System (**ECS**)
  - .1 Refer to Electrical.
- .3 Grab Bar 1 (**GB1**): Bobrick 6898.99. ('L' shape beside)
  - .1 30" (760 mm) x 30" (760 mm) 'L' shaped grab bar mounted as indicated on the drawings. Satin-finish 18-gauge type 304 stainless steel tubing 1-1/2" (38mm) diameters. Bar passes through flange and is heliarc welded to form single structural unit. Cover snaps over mounting flange to conceal screws. Concealed mounting flange 1/8" (3mm) thick stainless steel plate, 2" W x 3-1/8" H (50 x 80mm), with two screw holes for concealed anchors. Cover is 22-gauge (0.8mm) stainless steel with satin-finish, 3-1/4" (85mm) dia.
- .1 Grab Bar 2 (**GB2**): Bobrick 5806 series. (straight, behind)
  - .1 36" (915 mm) long grab bar as indicated on drawings. Satin-finish 18-gauge type 304 stainless steel tubing 1-1/4" (32mm) diameters. Bar passes through flange and is heliarc welded to form single structural unit. Cover snaps over mounting flange to conceal screws. Concealed mounting flange 1/8" (3mm) thick stainless steel plate, 2" W x 3-1/8" H (50 x 80mm), with two screw holes for concealed anchors. Cover is 22-gauge (0.8mm) stainless steel with satin-finish, 3-1/4" (85mm) dia.
- .2 Grab Bar 3 (**GB3**): Bobrick B-6806 series. (straight, vertical, beside urinal partition)
  - .1 1-1/2" (38mm) Diameter, 24" (610 mm) grab bar mounted as indicated on the drawings. Grab bar shall be type-304 stainless steel with satin-finish. Grab bar shall have 18-gauge (1.2mm) wall thickness and 1-1/2" (38mm) outside diameter. Clearance between the grab bar and wall shall be 1-1/2" (38mm). Concealed mounting flanges shall be 11-gauge (3.2mm) thick stainless steel plate, 2" x 3-1/8" (50 x 80mm), and equipped with at least two screw holes for attachment to wall. Flange covers shall be 22 gauge (0.8mm), 3-1/4" (85mm) diameter x 1/2" (13mm) deep, and shall snap over mounting flange to conceal mounting screws and/or Wingt fasteners. Ends of grab bar shall pass through concealed mounting flanges and be heliarc welded to form one structural unit. Grab bar shall comply with accessible design (including ADAAG in the U.S.A.) for structural strength.

- .3 Mirror (**Mirr**) and Mirror Barrier Free (**Mirr-BF**):
  - .1 Bobrick B-165 series, 30"h x 24"w. Mirror shall have a one piece stainless steel channel frame, 1/2" x 1/2" x 1/2" with 90 deg. mitered corners; all exposed surfaces shall have bright polished finish. Mirror shall No. 1 quality, 1/4" (6mm) glass mirror, warranted against silver spoilage for 15 years. Corners shall be protected by friction-absorbing filler strips. Back of all glass mirrors shall be protected by full-size, shock-absorbing, water-resistant, non abrasive, 3/16" thick polyethylene padding Galvanized steel back shall have integral horizontal hanging brackets located near top for mounting on concealed wall hangers
- .4 Paper Towel Dispenser (**PTD**) and Paper Towel Dispenser Barrier Free (**PTD-BF**):
  - .1 RESPONSE Model SKU HRT LEVER DISP. Black Plastic. Dispenser is 10-1/2" W, 15-3/4" H, 8-3/4" D. For rolls up to 8" diameter and 8" wide. Heavy gauge steel back.
- .5 Robe Hook (**RH**) and Robe Hook Barrier Free (**RH-BF**).
  - .1 Bobrick Model B-6717. Satin finish stainless steel.
- .6 Folding Utility Shelf (**SHF**): Bobrick model no. B-287.
  - .1 Folding utility shelf shall be type-304 stainless steel with all-welded construction: exposed surfaces shall have satin finish. Shelf shall be equipped with a heavy-duty internal spring. Shelf holds 100 lbs when properly installed. Shelf shall automatically return to upright position when not in use.
- .7 Soap Dispenser (**SD**):
  - .1 BETCO Mode R1000 Black Foaming bulk refill disp. Black Plastic. 12/cs bottle.
- .8 Toilet Paper Dispenser (**TPD**).
  - .1 Oceans Model R2090TBK. Black Pearl. 12" H, 10-3/4" W, 5-3/4" D. Core Diameter 3-1/4". Capacity: 9" JBT roll. Wall mounted.

## 2.4 FABRICATION

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.

- .7 Shop assemble components and package complete with anchors and fittings.
- .8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide steel anchor plates and components for installation on studding and building framing.

## 2.5 FINISHES

- .1 Chrome and nickel plating: to ASTM B 456, satin finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.
- .3 Manufacturer's or brand names on face of units not acceptable.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- .1 Install and secure accessories rigidly in place as follows:
  - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
  - .2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
  - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
  - .4 Toilet/shower compartments: use male/female through bolts.
- .2 Install grab bars on built-in anchors provided by bar manufacturer.
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.
- .5 Install mirrors in accordance with Section 08 80 50 - Glazing.

### 3.2 SCHEDULE

- .1 Locate accessories in location as indicated on the drawings. Confirm final layout with Consultant prior to installation.

END OF SECTION

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## PART 1 - GENERAL

### 1.1 RELATED SECTIONS

- .1 Division 1 – General Requirements
- .2 Section 03 10 00 – Concrete Forming
- .3 Section 03 30 00 – Cast-In-Place Concrete
- .4 Section 06 10 00 – Rough Carpentry
- .5 Division 22 - Plumbing

### 1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

### 1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples to be returned for inclusion into work.

### 1.4 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for recessed floor grille for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

### 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

## PART 2 - PRODUCTS

### 2.1 PRODUCTS

- .1 **Roller Shades Exterior (RS-A)** - Refer to Specialties Schedule. Sheer weave roller shade blinds, 3% sunscreen factor, 3.5" chain control mechanism, 3" enclosed cassette, fireproof or Class A fire resistant
  - .1 **Manufacturer:** Elite Pro Z
  - .2 **Series:** Z-300 Fascia - Proweave S
  - .3 **Size(s):** Measurements to be site verified.
  - .4 Mounting: As per manufacturers specifications. Mounting to coordinated on site as either ceiling or wall hung. Allow

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- .5 operable windows space to function with roller shade down.  
Fabric: To be selected from Proweave and Blackout product lines.
- .6 Colour: To be selected from Manufacturer's full Color Range.
- .7 **Alternate Manufacturers:** Subject to compliance with requirements, available alternate manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - .1 MiraMax
  - .2 Alternates as approved by the Consultant at time of tender.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### 3.2 INSTALLATION

- .1 Install and secure accessories rigidly in place as follows:
  - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
  - .2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
  - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.

### 3.3 ADJUSTING CLEANING AND PROTECTION

- .1 Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding
- .2 Protect installed materials from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction
- .3 Touch up marred finishes, or replace materials that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by manufacturer.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- .1 This section covers the general requirements for Mechanical systems. Read all divisions of the building specifications.
- .2 The mechanical work shall consist of the supply and installation of complete and operable systems and shall include all necessary labour, plant, materials and incidentals for the work involved.
- .3 The mechanical work shall include all of Division, 21, 22 and 23 as noted on the drawings and specifications.
- .4 Refer to the electrical and specification and note exact scope of work required by each trade.

### 1.2 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 61 00 – Common Product Requirements
- .3 Section 01 78 00 – Closeout Submittals
- .4 Section 01 45 00 – Quality Control
- .5 Section 08 31 00 – Access Doors – Mechanical & Electrical
- .6 Section 09 91 23 – Interior Painting

### 1.3 REFERENCES

- .1 General:
  - .1 All references, codes, regulation, by-laws, etc. as noted in the Specification for Divisions 21, 22 and 23 shall be the latest edition / revision, except where specific editions are specified.

### 1.4 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings; submit drawings to the Consultant for all equipment as outlined in the specifications and on the Mechanical drawings.
- .3 Shop drawings to show (as a minimum) (refer to equipment specification sections for details):
  - .1 Make & Model Number.
  - .2 Capacity.
  - .3 Dimensions.
  - .4 Installation arrangement.
  - .5 Plan View and sections.
  - .6 Weights.
  - .7 Operating characteristics.
  - .8 Operating Performance.
  - .9 Performance curves showing the operating point of the equipment.
  - .10 Piping hook-ups.
  - .11 Construction details.
  - .12 Energy Efficiency Ratings.
  - .13 Sound Data.

- .14 Mounting arrangements.
  - .15 Operating and maintenance clearances.
  - .16 Installation instructions.
  - .17 Electrical data and characteristics.
  - .18 Motor duty.
  - .19 Motor brand and model no.
  - .20 Wiring Diagrams.
  - .21 All miscellaneous equipment and accessories to complete the system.
  - .22 Schematic Flow Diagrams.
  - .23 Approvals.
- .4 Shop drawings and product data accompanied by:
- .1 Detailed drawings of bases, supports, and anchor bolts.
  - .2 Acoustical sound power data, where applicable.
  - .3 Points of operation on performance curves.
  - .4 Manufacturer to certify current model production.
  - .5 Certification of compliance to applicable codes.
- .5 In addition to transmittal letter referred to in Section 01 33 00 - Submittal Procedures use "Shop Drawing Submittal Stamping Sheet". Identify section and paragraph number. The General Contractor and all applicable subtrades shall provide their stamp and approval complete with signature and date prior to submission to Consultant for approval.
- .6 The mechanical contractor shall ensure that equipment has been checked for conformance with all the requirements of the drawings and specifications and that the equipment has been coordinated with other equipment to which it is attached or connected, and that all dimensions have been verified to ensure the proper installation of equipment within the available space without interference with the work of other trades. All information on the shop drawings such as wiring diagrams, accessories and details must be specifically prepared for this project. Shop drawings containing information irrelevant to this project will be rejected for resubmission. Make sure that electrical, controls and structural co-ordination is complete before submitting drawings for approval.
- .7 Closeout Submittals:
- .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
  - .2 Operation and maintenance manual approved by, and final copies deposited with, Consultant before final inspection.
  - .3 Operation data to include:
    - .1 Control schematics for systems including environmental controls.
    - .2 Description of systems and their controls.
    - .3 Operation instruction for systems and component.
    - .4 Description of actions to be taken in event of equipment failure.
    - .5 Valves schedule and flow diagram.
    - .6 Colour coding chart.
  - .4 Maintenance data to include:

- .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
- .2 Data to include schedules of tasks, frequency, tools required and task time.
- .5 Performance data to include:
  - .1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
  - .2 Equipment performance verification test results.
  - .3 Special performance data as specified.
- .6 Approvals:
  - .1 Submit 2 copies of draft Operation and Maintenance Manual to Consultant for approval. Submission of individual data will not be accepted unless directed by Consultant.
  - .2 Make changes as required and re-submit as directed by Consultant.
- .7 Additional data:
  - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
- .8 Site records:
  - .1 Consultant will provide 1 set of reproducible mechanical drawings. Mark changes as work progresses and as changes occur.
  - .2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.
  - .3 Use different colour waterproof ink for each service.
  - .4 Make available for reference purposes and inspection.
- .9 As-built drawings:
  - .1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.
  - .2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
  - .3 Submit to Consultant for approval and make corrections as directed.
  - .4 Perform testing, adjusting and balancing for HVAC using as-built drawings.
  - .5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.
- .10 Submit copies of as-built drawings for inclusion in final TAB report.

#### 1.5 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

#### 1.6 MAINTENANCE

- .1 Furnish spare parts in accordance with Section 01 78 00 - Closeout Submittals as follows:

- 1.7 DELIVERY, STORAGE, AND HANDLING
- .1 Material Delivery Schedule: coordinate delivery of material to suit proposed construction schedule.
  - .2 Construction/Demolition Waste Management and Disposal: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .3 Building Loads
    - .1 Before loading any part of the structure, make sure that the construction is sufficiently complete and that concrete has attained sufficient strength to support such loads.
- 1.8 SYSTEM STARTUP
- .1 Instruct Consultant and Owner's Operating Personnel in operation, care and maintenance of systems, system equipment and components.
  - .2 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.
- 1.9 OPERATING INSTRUCTIONS AND MAINTENANCE DATA
- .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
  - .2 Operating instructions to include the following:
    - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
    - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
    - .3 Safety precautions.
    - .4 Procedures to be followed in event of equipment failure.
    - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
  - .3 Names and addresses of nearest suppliers for all items included in maintenance manuals.
  - .4 Print operating instructions and frame under glass or in approved laminated plastic.
  - .5 Post instructions where directed.
  - .6 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
  - .7 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

## PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements

- .2 This section covers the materials and methods of workmanship of items that are common to more than one section of division 21, 22, and 23.
- .3 Verify installation and co-ordination responsibilities related to equipment and controls, as indicated.
- .4 Access doors in ducts: Refer to 08 31 00
  - .1 Manufactured from 2mm core thickness galvanized steel, c/w galvanized concealed hinges, positive locking screwdriver or cam lock, include neoprene sponge air seal all around.
  - .2 Standard of acceptance: Acudor, Nailor, Maxam
- .5 Other access doors: Refer to 08 31 00
  - .1 Flush mounted 610mmx610mm for body entry and 305mmx305mm or hand entry unless otherwise noted. Doors shall open 180°, have rounded safety corners, concealed hinges, screwdriver latches and anchor straps. Steel shall be prime coated. Doors in fire rated assemblies shall be fire rated.
  - .2 Standard of acceptance: Acudor, Nailor, Maxam.

### PART 3 – EXECUTION

#### 3.1 EQUIPMENT REQUIREMENTS AND INSTALLATION

- .1 Comply with Division 1 for coordination of the work with other trades.
- .2 Carry out complete installation in such a manner that will permit equipment maintenance and disassembly by use of unions or flanges, will minimize disturbance to connecting piping and duct systems and will be free of interference with building structure or other equipment.
- .3 Rigidly comply with manufacturer's instructions and recommendations for the installation of equipment. Where required, arrange and pay for the manufacturers' field engineer to supervise the installation of the equipment.

#### 3.2 HANGERS & SUPPORTS

- .1 .1 Fabricate hangers, supports and sway braces in accordance with ANSI B31.1 and requirements of ULC C203.
- .2 Set inserts in position in advance of concrete work.
- .3 Support all equipment and piping from structural members. Where structural supports do not exist or inserts are not in suitable locations, suspend hangers from steel channels or angles. Provide supplementary structural members. Obtain approval before using expansion shields. Use minimum two shields for each hanger. **DO NOT SUSPEND FROM METAL DECK**. Anchoring of piping and equipment shall be to manufacturers recommendations. Provide special supports for equipment where required, fabricated from welded steel structural members. Provide shop drawings and obtain their approval when requested.

- .4 Provide split adjustable steel ring hangers on piping NPS 50mm dia. and under and clevis type for NPS greater than 50mm dia. Use roller type hangers as required.
- .5 Provide rigid hangers, swing hangers or pipe rollers complete with bracing for hot water supply and return, domestic hot & cold water and hot water recirculation pipes in accordance with the following:

<u>Hanger Type</u>	<u>Rigid</u>	<u>Swing</u>	<u>Pipe Roller</u>
Pipe expansion to hanger rod length	<1/24	1/24-1/6	>1/6
Minimum rod length	305mm	305mm	305mm

- .6 Provide pipe roller stand on supplementary structural members where hangers cannot be used.
- .7 Provide spring hangers where required to offset expansion on horizontal runs which follow long vertical risers.
- .8 Use the smallest pipe size to determine spacing between pipe rack supports.
- .9 Use rod diameters and support spacing as shown in the following table except where specified otherwise:

Rod Diameter and Support Spacing Table

<u>Pipe Size (Nominal)</u>	<u>Maximum Support Spacing</u>		<u>Copper Pipe</u>
	<u>Rod Diameter</u>	<u>Steel Pipe</u>	
15mm	8mm	-	1525mm
20mm – 25mm	9.5mm	1830mm	1830mm
32mm	9.5mm	1830mm	1830mm
40mm	9.5mm	2750mm	2440mm
50mm	9.5mm	3050mm	2750mm
65mm – 80mm	9.5mm	3660mm	3050mm

- .10 Support plumbing piping in accordance with the more stringent requirements of authorities having jurisdiction, plumbing code, or as specified above.
- .11 Place support within 300mm of each horizontal elbow and within 600mm of each side of valve or tee.
- .12 Mild steel wall hooks may be used to support non-expanding piping. Allow 25mm minimum clearance for insulated pipe.
- .13 Provide riser clamps for all risers unless detailed otherwise.
- .14 Uninsulated copper piping, use copper hangers or 6mm lead crimped to hanger between copper and ferrous hanger.
- .15 Provide insulation saddles for insulated pipe and prefabricated insulation shields with high density insulation. Grinnel Fig. Nos. 160 to 167.

- .16 Offset hanger pipe and structural attachments in such a manner that rod is vertical when piping is hot and equalize loads on all hangers where possible.

### 3.3 SLEEVES

- .1 Provide pipe sleeves at all points where pipes pass through masonry or concrete. Sleeves shall be at least 20 gauge core thickness galvanized sheet steel with lock seam joints.
- .2 Provide cast iron pipe sleeve with integral annular fin or steel pipe sleeves with annular fin continuously welded at midpoint where the sleeve passes through foundation walls or extends above finished floor.
- .3 Size sleeves to provide 6mm clearance all around, between sleeve and pipes or between sleeve and insulation. As a minimum where piping passes below footings, provide a clearance of at least 50mm between sleeve and pipe. Backfill around pipe sleeve up to underside of footing with concrete of the same strength as the footing. Do not embed pipe in concrete.
- .4 Terminate sleeves flush with vertical surface of concrete and masonry or 100mm above floors.
- .5 For pipes passing through roofs, provide cast iron sleeves with caulking recess and flashing clamp device. Anchor sleeves in roof construction; caulk between sleeve recess and pipe; fasten roof flashing to clamp device; make water-tight durable joint.
- .6 Fill voids around pipes as follows:
  - .1 Caulk between sleeve and pipe in foundation walls and below grade floors.
  - .2 Where sleeves pass through walls or floors, caulk space between insulation and sleeve or between pipe and sleeve with waterproof fire retardant non-hardening mastic.
- .7 Ensure no contact between copper tube or pipe and ferrous sleeve.
- .8 On any exterior wall penetrations, provide special modular mechanical closures, "Link-Seal" as manufactured by Thunderline Corporation, to provide a watertight seal between pipe and wall sleeve.
- .9 Fill future-use sleeves with easily removable filler.
- .10 Coat exposed exterior surfaces of ferrous sleeves with heavy application of zinc rich paint.
- .11 Temporarily plug all pipe openings during construction.

### 3.4 FIRESTOPPING

- .1 All firestopping and smoke sealing (except for fire dampers) required for mechanical service penetrations of rated walls, floors and partitions shall be the responsibility of Division 7.

.2 Fire Compartments are indicated on Architectural Drawings

**3.5 ESCUTCHEONS AND PLATES**

.1 Provide escutcheons on exposed pipes passing through finished walls, partitions, floors and ceilings and secure to pipe or finished surface but do not secure to insulation. Inside diameter shall fit around the finished pipe or insulation. Outside diameter shall cover the opening or sleeve.

**3.6 ACCESS DOORS**

.1 Supply access doors for furred ceilings or spaces for servicing equipment and accessories or for inspection of safety, operating, or fire devices for installation by the appropriate trade.

**3.7 DIELECTRIC COUPLINGS**

.1 Provide wherever pipes of dissimilar metals are joined.

.2 Provide insulating unions for pipe sizes 50mm and under; flanges for pipe sizes over 50mm.

.3 Provide felt or rubber gaskets to prevent contact of dissimilar metals.

**3.8 PAINTING REPAIRS AND RESTORATION**

.1 Painting of equipment and material installed under Division 21, 22 and 23 is not part of the mechanical work except as noted.

.2 Do painting in accordance with Section 09 91 23 - Interior Painting.

.3 Prime and touch up marred finished paintwork to match original.

.4 Restore to new condition, finishes which have been damaged.

.5 Clean all uncoated metal surfaces such as piping, fittings, valves, and equipment and leave ready for painting.

.6 Prime uncoated metal surfaces in areas exposed to view that will be inaccessible to painter after installation.

.7 Assist painter to determine proper colour coding.

**3.9 CANNING OR SLEEVEING OF OPENINGS & HANGER INSERTS**

.1 Provide all cans or forms required for openings in poured-in-place concrete to suit pipes or ducts etc. Locate each in place, well in advance of concrete pouring.

.2 Where cutting of the building framing or envelope is required to suit the work of this division, mark out the exact dimensions and position of such work and obtain the approval of the Consultant before carrying out cutting.

.3 Supply all sleeves and hanger inserts required for the work of this division.

**3.10 CLEANING**

.1 Clean interior of ductwork and air handling units.

**3.11 FIELD QUALITY CONTROL**

.1 Testing Piping Systems:  
.1 Conduct tests in accordance with Section 01 45 00 - Quality



- Control and submit report as described in PART 1 - SUBMITTALS.
- .2 Conduct tests and pay for all associated work including making good and re-testing when required.
- .3 Notify Consultant 48 hours in advance of date when tests will be conducted.
- .4 Make sure all work has been tested and approved prior to insulating or concealing.
- .5 Carry out tests in the presence of the Consultant and the Authority having jurisdiction.
- .6 Forward written test results to the Consultant.
- .7 Schedule of Tests:
- | <u>Service</u>   | <u>Test Pressure</u> | <u>Testing Fluid</u> | <u>Duration</u> |
|------------------|----------------------|----------------------|-----------------|
| Water Systems    | 200 psi              | Water                | 2 hours         |
| Drainage Systems | 5 psi                | Water                | 6 hours         |
- .8 Carry out tests on the water supply and drainage systems in accordance with governing bodies.
- .9 Leave all work uncovered until completion of testing. However, should the construction schedule require that work be covered, carry out tests on portions of system prior to system covering. Give a minimum of 48 hours notice to Consultant prior to testing.

### 3.12 PROTECTION

- .1 Protect equipment and material during construction from the weather, moisture, dust, painting, plastering and physical damage. Cover all equipment with polyethylene plastic sheets during plaster or concrete work and clean and return to "as new" condition prior to Substantial Performance of the Work. Provide for repainting of marked or damaged surfaces as required.
- .2 Mask or grease and cover machined surfaces. Securely cover equipment openings and open ends of piping, conduit, and ductwork as work progresses.
- .3 Any equipment that has operating parts, bearings, or machined surfaces that show signs of rusting, pitting, or physical damage will be rejected.

### 3.13 CLEAN-UP

- .1 At all times keep the premises free from accumulations of waste material caused by employees or work, and at the completion of the work, remove surplus materials and leave area "broom clean" or equivalent, unless otherwise specified.

END OF SECTION

## PART 1 - GENERAL

- 1.1 SUMMARY
- .1 Co-operate and co-ordinate with the requirements of other units of work specified in other sections.
  - .2 This section covers the insulation of the following:
    - .1 Domestic hot, cold, and hot water recirculation piping
- 1.2 REFERENCES
- .1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
    - .1 ASHRAE Standard 90.1-2010, Energy Standard for Buildings Except Low-Rise Residential Buildings (IESNA co-sponsored; ANSI approved; Continuous Maintenance Standard).
- 1.3 DEFINITIONS
- .1 For purposes of this section:
    - .1 "CONCEALED" - insulated mechanical services in suspended ceilings and non-accessible chases and furred-in spaces.
    - .2 "EXPOSED" - will mean "not concealed" as specified.
  - .2 TIAC ss:
    - .1 CRF: Code Rectangular Finish.
    - .2 CPF: Code Piping Finish.
- 1.4 DELIVERY, STORAGE AND HANDLING
- .1 Packing, shipping, handling and unloading:
    - .1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.
    - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
    - .3 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
  - .2 Storage and Protection:
    - .1 Protect from weather, construction traffic.
    - .2 Protect against damage.
    - .3 Store at temperatures and conditions required by manufacturer.

## PART 2 - PRODUCTS

- 2.1 FIRE AND SMOKE RATING
- .1 In accordance with CAN/ULC-S102.
    - .1 Maximum flame spread rating: 25.
    - .2 Maximum smoke developed rating: 50.
- 2.2 INSULATION
- .1 Mineral fibre specified includes glass fibre, rock wool, slag wool.
  - .2 Thermal conductivity ("k" factor) not to exceed specified values at 24

degrees C mean temperature when tested in accordance with ASTM C 335.

- .3 TIAC Code A-1: rigid moulded mineral fibre without factory applied vapour retarder jacket.
  - .1 Mineral fibre: to CAN/ULC-S702.
  - .2 Maximum "k" factor: to CAN/ULC-S702.
- .4 TIAC Code A-3: rigid moulded mineral fibre with factory applied vapour retarder jacket.
  - .1 Mineral fibre: to CAN/ULC-S702.
  - .2 Jacket: to CGSB 51-GP-52Ma.
  - .3 Maximum "k" factor: to CAN/ULC-S702.
- .5 TIAC Code C-2: mineral fibre blanket faced with factory applied vapour retarder jacket (as scheduled in PART 3 of this section).
  - .1 Mineral fibre: to CAN/ULC-S702.
  - .2 Jacket: to CGSB 51-GP-52Ma.
  - .3 Maximum "k" factor: to CAN/ULC-S702.
- .6 TIAC Code A-6: flexible unicellular tubular elastomer.
  - .1 Insulation: with vapour retarder jacket.
  - .2 Jacket: to CGSB 51-GP-52Ma.
  - .3 Maximum "k" factor: to CAN/ULC-S702.
  - .4 Certified by manufacturer: free of potential stress corrosion cracking corrodants.
- .7 TIAC Code A-2: rigid moulded calcium silicate in sections and blocks, and with special shapes to suit project requirements.
  - .1 Insulation: to ASTM C 533.
  - .2 Maximum "k" factor: to CAN/ULC-S702.
  - .3 Design to permit periodic removal and re-installation.

## 2.3 INSULATION SECUREMENT

- .1 Tape: self-adhesive, aluminum, reinforced, 50 mm wide minimum.
- .2 Contact adhesive: quick setting.
- .3 Canvas adhesive: washable.
- .4 Bands: stainless steel, 19 mm wide, 0.5 mm thick.

## 2.4 CEMENT

- .1 Thermal insulating and finishing cement:
  - .1 Hydraulic setting or Air drying on mineral wool, to ASTM C 449/C 449M.

## 2.5 VAPOUR RETARDER LAP ADHESIVE

- .1 Water based, fire retardant type, compatible with insulation.

## 2.6 INDOOR VAPOUR RETARDER FINISH

- .1 Vinyl emulsion type acrylic, compatible with insulation.

2.7 OUTDOOR VAPOUR  
RETARDER FINISH

- .1 Vinyl emulsion type acrylic, compatible with insulation.
- .2 Reinforcing fabric: fibrous glass, untreated 305 g/m<sup>2</sup>.

2.8 JACKETS

- .1 Polyvinyl Chloride (PVC):
  - .1 Use PVC jackets only where surface temperature is between -20 degrees C and 65 degrees C only.
  - .2 One-piece moulded type to CAN/CGSB-51.53 with pre-formed shapes as required.
  - .3 Colours: White
  - .4 Minimum service temperatures: -20 degrees C.
  - .5 Maximum service temperature: 65 degrees C.
  - .6 Moisture vapour transmission: 0.02 perm.
  - .7 Fastenings:
    - .1 Use solvent weld adhesive compatible with insulation to seal laps and joints.
    - .2 Tacks.
    - .3 Pressure sensitive vinyl tape of matching colour.
  - .8 Special requirements:
    - .1 Outdoor: UV rated material at least 0.5mm thick.

PART 3 - EXECUTION

3.1 MANUFACTURER'S  
INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 PRE-INSTALLATION  
REQUIREMENT

- .1 Pressure testing of piping systems and adjacent equipment to be complete, witnessed and certified.
- .2 Surfaces clean, dry, free from foreign material.

3.3 INSTALLATION

- .1 Install in accordance with TIAC National Standards.
- .2 Apply materials in accordance with manufacturers instructions and this specification.
- .3 Use two layers with staggered joints when required nominal wall thickness exceeds 75 mm.
- .4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
  - .1 Install hangers, supports outside vapour retarder jacket.
- .5 Supports, Hangers:
  - .1 Apply high compressive strength insulation, suitable for service, at oversized saddles and shoes where insulation

saddles have not been provided.

- .6 Fittings
  - .1 Insulate fittings with sections of the pipe covering mitred to fit tightly, or strips of flexible insulation, then apply reinforcing membrane embedded in barrier coating. Alternatively insulate fittings with tightly placed flexible insulation and apply PVC fitting covers.
- .7 Valves
  - .1 Insulate valve bodies, bonnets and strainers with insulating cement; or with fitted pipe coverings; or with mitred blocks all to thickness of adjacent pipe covering, then apply reinforcing membrane embedded in barrier coating. Alternatively, insulate with tightly placed flexible insulation covered with reinforcing membrane, stapled in place and covered with a barrier coating. Leave drains, blow-off plugs and caps uncovered.
- .8 Insulation Termination Points
  - .1 Terminate insulation 3" from fittings to provide working clearance and bevel insulation at 45° angle.

#### 3.4 PIPING INSULATION SCHEDULES

- .1 Includes valves, valve bonnets, strainers, flanges and fittings unless otherwise specified.
- .2 In piping 1 in. or less, insulation is not required for strainers, control valves and balancing valves.
- .3 TIAC Code: A-1.
  - .1 Securements: bands, Tape at 300 mm on centre.
  - .2 Seals: lap seal adhesive, lagging adhesive.
  - .3 Installation: TIAC Code 1501-H.
- .4 TIAC Code: A-3.
  - .1 Securements: bands, Tape at 300 mm on centre.
  - .2 Seals: VR lap seal adhesive, VR lagging adhesive.
  - .3 Installation: TIAC Code: 1501-C.
- .5 TIAC Code: A-6.
  - .1 Insulation securements: Tape.
  - .2 Seals: lap seal adhesive, lagging adhesive.
- .6 TIAC Code: C-2 with vapour retarder jacket.
  - .1 Securements: bands, Tape at 300 mm on centre.
  - .2 Seals: lap seal adhesive, lagging adhesive.
  - .3 Installation: TIAC Code: 1501-C.
- .7 Thickness of insulation as listed in following table.
  - .1 Thicknesses listed below are based upon adherence to ASHRAE 90.1.
  - .2 Run-outs to individual units and equipment not exceeding 4000 mm long.

- .3 Do not insulate exposed runouts to plumbing fixtures, chrome plated piping, valves, fittings.

<u>Service</u>	<u>Operating Temperature (°F)</u>	<u>TIAC Code</u>	<u>Pipe Diameter</u>	<u>Insulation Thickness</u>
Domestic Cold Water, and Above Ground Storm Water & Vertical Rainwater leaders (Anti-Sweat)		A-3 or C-2	1 1/4" and under	13 mm (1/2")
			1 1/2" and over	25 mm (1")
Domestic Hot Water and Hot Water Recirculation	<140 °F	A-3	1 1/4" and under	25 mm (1")
			1 1/2" and over	38 mm (1 1/2")

- .8 Finishes:  
.1 Exposed indoors: PVC jacket.  
.2 Exposed in mechanical rooms: PVC jacket.  
.3 Concealed, indoors: insulation on concealed piping will be left as factory finished with no further finish required. .

### 3.5 FIELD QUALITY CONTROL

- .1 Use only licensed journeymen for the work.
- .2 Apply insulation materials, accessories and finishes in accordance with manufacturer's recommendations.
- .3 Carry out insulation work only after the following conditions have been met:  
.1 Required tests have been completed;  
.2 Surfaces to be covered are clean and dry;  
.3 Ferrous surfaces have been painted.
- .4 Use only clean and dry insulation for the work.
- .5 Install insulation with smooth and even surfaces, with round shapes laid to true circular and concentric shape, shape to blend with fitting insulation and adjacent covering; with full length section and tight to insulated object.
- .6 Supports:  
.1 Do not penetrate vapour seals with pipe hangers and supports.  
.2 Vertical pipe over 80mm: use insulation supports welded or bolted to pipe directly above lowest pipe fitting, thereafter locate on 4600mm centres and at each valve or pair of line flanges.  
.3 Space insulation and support for movement of piping as

required.

- .7 Penetrations:
  - .1 For covered or uncovered pipes, pack mineral fibre insulation solidly around pipes where they pass through sleeves, for depth of penetration. Those with vapour barrier jacket shall have continuous covering. Make sure that pipe sleeves accommodate full thickness of insulation and allow pipe expansion. Provide mastic topping to seal annular space.
- .8 Butt Joints:
  - .1 Adhere and seal laps of vapour barrier cover or use 100 mm wide vapour barrier strip using vapour seal adhesive.
  - .2 Stagger both longitudinal and horizontal joints on duct insulation in multi-layered construction.
  - .3 At each end of unions and flanges on low pressure systems, at pipe hangers, and at other points where required, terminate insulation with insulation cement trowelled on bevel.
- .9 Allow for radial expansion of pipe and permit pipe to move longitudinally inside insulation and to expand and contract without opening up joints between sections.
- .10 Gouge out insulation for proper fit where there is interference between weld bead and insulation. Bevel insulation away from studs and nuts to permit their removal without damage to insulation. Closely and neatly trim insulation around extending parts of pipe saddles, supports, hangers, and clamp guides and seal with insulating cement.
- .11 For all locations where pipe hangers are on the outside of the insulation, provide insulation saddles or blocks of high density insulation to prevent crushing or compression of insulation due to weight of pipe.

### 3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, garbage, tools and equipment.

END OF SECTION

PART 1 DRA. REFE - GENERAL

1.1 SUMMARY

- .1 All pipe and fittings provided by this Section shall be approved by all Authorities and meet all regulations. The products shall bear all necessary labels and markings including the CSA logo for CSA certifications and a ULC label to confirm Flame Spread Rating and or Smoke Developed Classification values. Do not install pipe or fittings that fail to meet the Plumbing and Building Code requirements. Secure these approvals prior to installation
- .2 Drainage Piping suitable materials for service:

SERVICE	MATERIAL			Specification Section
	TYPE OF PIPE AND FITTING	ABOVE GRADE	BELOW GRADE	
Sanitary Drains and Vents	ABS	X	O	22 13 18
	PVC	O	O	22 13 18
Storm Drain	Cast Iron	O	X	22 13 17
	PVC	O	O	22 13 18
Legend: X – Not Permitted O - Permitted				

1.2 RELATED REQUIREMENTS

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 45 00 – Quality Control
- .3 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .4 Section 01 78 00 – Closeout Submittals.
- .5 Section 21 05 01 – Common Work Results for Mechanical

1.3 REFERENCES

- .1 ASTM International Inc.
- .1 ASTM D 2235, Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
- .2 ASTM D 2564, Standard Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.
- .2 Canadian Standards Association (CSA International)
- .1 CAN/CSA-Series B1800, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.



- 1.4 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Provide manufacturer's printed product literature and datasheets for adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.5 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

## PART 2 - PRODUCTS

- 2.1 MATERIAL/COMPONENT STANDARDS
- .1 ABS Pipe and Fittings: to CAN/CSA-B18.1.1-M.
  - .2 PVC Pipe and Fittings: to CAN/CSA-B181.2-M.
  - .3 Polyethylene Pipe and Fittings: to CAN/CSA-B137.1-M
  - .4 Plastic Underground Drainage Pipe and Fittings: to CAN/CSA-B182.1.
- 2.2 SANITARY, STORM AND VENT PIPE AND FITTINGS (UNDERGROUND ONLY)
- .1 For sizes 40mm and larger, IPEX 'System 15' (or approved equal) PVC DWV Pipe and Fittings certified to CSA B181.2 shall be installed. The joining method for 'System 15' (or approved equal) pipe and fittings shall include the use of either (a) Purple primer for PVC (Xirtec 7) and CSA certified PVC solvent cement (IPEX 'System 15' Two-Step), or (b) for sizes no greater than 6 inches, IPEX 'System 15' One-Step PVC Cement, both as supplied by IPEX Inc. (Contact IPEX Inc. prior to installation for proper cementing procedures). Pipe and fittings shall have a third-party listing from ULC or ITS to exhibit a Flame Spread Rating of not greater than 25 when tested according to ULC S102.2.
- 2.3 SANITARY, STORM AND VENT PIPE AND FITTINGS (ABOVE GROUND (PLENUM RATED))
- .1 For sizes 40mm and larger, IPEX 'System XFR' (or approved equal) PVC DWV Pipe and Fittings certified to CSA B181.2 shall be installed. The joining method for 'System XFR' shall be as indicated above. Pipe and fittings shall have a third-party listing from ULC or ITS to exhibit a Flame Spread Rating of not greater than 25 and a Smoke Developed Classification of not greater than 50 when tested according to ULC S102.2.
- 2.4 JOINTS
- .1 Solvent weld for PVC: to ASTM D 2564.
  - .2 Solvent weld for ABS: to ASTM D 2235.
  - .3 For sizes 40mm and larger, IPEX 'System XFR' PVC DWV Pipe and Fittings certified to CSA B181.2 shall be installed. The joining method for 'System XFR' shall be as indicated above. Pipe and fittings shall

have a third-party listing from ULC or ITS to exhibit a Flame Spread Rating of not greater than 25 and a Smoke Developed Classification of not greater than 50 when tested according to ULC S102.2.

### PART 3 - EXECUTION

#### 3.1 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### 3.2 INSTALLATION

- .1 In accordance with Section 23 05 05 - Installation of Pipework.
- .2 Install in accordance with Ontario Building Code, Ontario Provincial Plumbing Code and local authority having jurisdiction.

#### 3.3 TESTING

- .1 Pressure test buried systems before backfilling.
- .2 Hydraulically test to verify grades and freedom from obstructions.

#### 3.4 PERFORMANCE VERIFICATION

- .1 Cleanouts:
  - .1 Ensure accessible and that access doors are correctly located.
  - .2 Open, cover with linseed oil and re-seal.
  - .3 Verify cleanout rods can probe as far as the next cleanout, at least.
- .2 Test to ensure traps are fully and permanently primed.
- .3 Ensure fixtures are properly anchored, connected to system and effectively vented.
- .4 Affix applicable label (storm, sanitary, vent, pump discharge) complete with directional arrows every floor or 4.5 m (whichever is less).

#### 3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

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PART 1 - GENERAL

1.1 SUMMARY

- .1 Section Includes:
  - .1 The supply and installation of Plumbing Fixtures and Trim.
- .2 Products Installed but not Supplied Under this Section:
  - .1 Install rough-in for equipment supplied by others, complete with valves on hot and cold water supplies, waste and vent.
  - .2 Equipment installed by others.
    - .1 Connect with unions.
  - .3 Equipment not installed.
    - .1 Capped for future connection by others.
  - .4 This includes all Owner supplied equipment being installed under this project. Refer to Architectural Drawings for further details.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .3 Section 01 78 00 – Closeout Submittals.
- .4 Section 22 13 18 – Drainage Waste and Vent Piping Plastic

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International).
  - .1 CAN/CSA-B45 Series, Plumbing Fixtures.
  - .2 CAN/CSA-B125, Plumbing Fittings.
  - .3 CAN/CSA-B651, Barrier-Free Design.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Closeout Submittals:
  - .1 Submit maintenance data in accordance with Section 01 78 00 – Closeout Submittals.
  - .2 Include:
    - .1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.
    - .2 Details of operation, servicing, maintenance.
    - .3 List of recommended spare parts.

1.5 DELIVERY STORAGE AND DISPOSAL

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.

## PART 2 - PRODUCTS

### 2.1 PLUMBING FIXTURE SCHEDULE

- .1 The "Plumbing Fixture Schedule" lists all commercial plumbing fixtures supplied under this Division and is found in the drawing package.
- .2 Read this schedule, together with the drawings and other Sections of this Specification specific to each area of construction, in order to determine the scope of the Division 22 Plumbing work required for the plumbing fixtures listed.

### 2.2 MATERIAL

- .1 Provision of plumbing and drainage systems, providing new waste, drainage, vent, hot and cold water piping systems complete with new fixtures and equipment as indicated on the plumbing drawings and as per the plumbing fixture schedule.
- .2 In case of discrepancy between architectural and mechanical drawings as to number and location of fixtures, the architectural drawings shall govern.
- .3 Plumbing fixtures and fittings shall be product of one manufacturer and of same colour in any one washroom or location and to be as per drawing fixture schedule.
- .4 Materials: Vitreous china to CSA B45.1. Plumbing fittings to CSA B125. Exposed plumbing brass and metal work shall be heavy triple chromium plated.

### 2.3 MANUFACTURED UNITS

- .1 Fixtures: manufacture in accordance with CAN/CSA-B45 series.
- .2 Trim, fittings: manufacture in accordance with CAN/CSA-B125.
- .3 Exposed plumbing brass to be heavy triple chromium plated.
- .4 Number, locations: architectural drawings to govern.
- .5 Fixtures in any one location to be product of one manufacturer and of same type.
- .6 Trim in any one location to be product of one manufacturer and of same type.
- .7 Fixture piping:
  - .1 Hot and cold water supplies to each fixture:
    - .1 Chrome plated rigid supply pipes each with handwheel stop, reducers, escutcheon.
  - .2 Waste:
    - .1 Brass P trap with clean out on each fixture not having integral trap.
    - .2 Chrome plated in all exposed places.
- .8 Chair carriers:
  - .1 Factory manufactured floor-mounted carrier systems for all

wall-mounted fixtures.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- .1 Mounting heights:
  - .1 Standard: as per architectural drawings and elevations and the Ontario Building Code and the local requirements of all the authorities having jurisdiction.
  - .2 Wall-hung fixtures: as indicated on the architectural drawings and elevations and the Ontario Building Code, and the local requirements of all the authorities having jurisdiction, measured from finished floor.
  - .3 Physically handicapped: to comply with most stringent of the Architectural Drawings and Elevations, Ontario Building Code, and the local requirements of all the authorities having jurisdiction or CAN/CSA B651.
  - .4 Contractor to provide a mock-up of fixtures as required by the consultant to ensure that there are no interferences with fixtures, sensor operated flush valves, grab bars and bathroom accessories. Contractor to provide at a minimum the fixtures, grab bars, sensors and bathroom accessories for a typical Barrier Free Water closet. Other mock-ups maybe required at the Consultant's request.

#### 3.2 ADJUSTING

- .1 Conform to water conservation requirements specified this section.
- .2 Adjustments:
  - .1 Adjust water flow rate to design flow rates.
  - .2 Adjust pressure to fixtures to ensure no splashing at maximum pressures.
- .3 Checks:
  - .1 Aerators: operation, cleanliness.
  - .2 Vacuum breakers, backflow preventers: operation under all conditions.
  - .3 Wash fountains: operation of flow-actuating devices.
- .4 Thermostatic controls:
  - .1 Verify temperature settings, operation of control, limit and safety controls.

END OF SECTION

---

PART 1 - GENERAL

- 1.1 SUMMARY .1 Section Includes:
- .1 Materials and installation for plumbing specialties and accessories.
- 1.2 RELATED SECTIONS .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .3 Section 01 78 00 - Closeout Submittals.
  - .4 Section 22 13 17 – Drainage Waste and Vent Piping Plastic
- 1.3 SUBMITTALS .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and datasheet for fixtures and equipment.
    - .2 Indicate dimensions, construction details and materials for specified items.
  - .3 Shop Drawings:
    - .1 Submit shop drawings to indicate materials, finishes, method of anchorage, number of anchors, dimensions, construction and assembly details and accessories for all fixture as required for system installation and indicated in the plumbing fixture schedule
  - .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .5 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals, include:
    - .1 Description of plumbing specialties and accessories, giving manufacturers name, type, model, year and capacity.
    - .2 Details of operation, servicing and maintenance.
    - .3 Recommended spare parts list.
- 1.4 DELIVERY, STORAGE AND HANDLING .1 Packing, shipping, handling and unloading:
- .1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.

## PART 2 - PRODUCTS

2.1 MATERIALS .1 Installation shall be in strict accordance with the current editions of the Ontario Plumbing Code, Ontario Building Code, and local requirements of all authorities having jurisdiction.

.2 All material to be CSA approved for intended application.

2.2 FLOOR DRAINS .1 Refer to the plumbing fixture schedule.

.2 All floor drains to correspond to the flooring type. Refer to architectural drawings for details. In case of discrepancy between architectural and mechanical drawings as to the flooring type and associated drain type, the architectural drawings shall govern.

.3 In case of discrepancy between architectural and mechanical drawings as to number and location of Floor Drains, the Mechanical drawings shall govern.

2.3 CLEANOUTS .1 Refer to the plumbing fixture schedule.

.2 Quantities shown on drawings are for coordination of specific cleanouts. Provide all clean outs, additional to those shown on plans as required to conform to the Ontario Building Code.

2.4 VACUUM BREAKERS .1 Breakers: to CSA-B64 Series, vacuum breaker atmospheric.

2.5 TRAP SEAL PRIMERS .1 Trap Seal Primers: Traps in floor drains and hub drains require priming according to plumbing code. Provide priming device piped to nearest lavatory, urinal or water closet so that device will introduce regulated amount of water into trap whenever fixture is used. All floor drains and hub drains require a TSP device.

## PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 INSTALLATION .1 Installation shall be in strict accordance with the current editions of the Ontario Plumbing Code, Ontario Building Code, and local requirements of all authorities having jurisdiction.

.2 Install in accordance with manufacturer's instructions and as specified.

### 3.3 CLEANOUTS

- .1 Install cleanouts at base of soil and waste stacks, and rainwater leaders, at locations required code, and as indicated.
- .2 Bring cleanouts to wall or finished floor unless serviceable from below floor.
- .3 Building drain cleanout and stack base cleanouts: line size to maximum NPS4.

### 3.4 TRAP SEAL PRIMERS

- .1 Install for all new floor drains and hub drains, and elsewhere, as indicated.
- .2 Install on cold water supply to nearest frequently used plumbing fixture, in concealed space.
- .3 Install soft copper tubing to floor drain.

### 3.5 TESTING AND ADJUSTING

- .1 Timing:
    - .1 After start-up deficiencies rectified.
    - .2 After certificate of completion has been issued by authority having jurisdiction.
  - .2 Floor drains:
    - .1 Verify operation of trap seal primer.
    - .2 Prime, using trap primer. Adjust flow rate to suit site conditions.
    - .3 Check operations of flushing features.
    - .4 Check security, accessibility, removeability of strainer.
    - .5 Clean out baskets.
  - .3 Access doors:
    - .1 Verify size and location relative to items to be accessed.
  - .4 Cleanouts:
    - .1 Verify covers are gas-tight, secure, yet readily removable.
- END OF SECTION



## PART 1 - GENERAL

- |   |    |  |
|---|----|--|
| <u>1.1 SUMMARY</u>                        | .1 | Section Includes: <ul style="list-style-type: none"><li>.1 Materials and installation of low-pressure metallic ductwork, joints and accessories.</li></ul>   |
| <u>1.2 RELATED SECTIONS</u>               | .1 | Section 01 33 00 – Submittal Procedures.   |
|   | .2 | Section 01 74 21 – Construction/Demolition Waste Management and Disposal.  |
|   | .3 | Section 07 84 00 – Firestopping.   |
| <u>1.3 REFERENCES</u>                     | .1 | American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).  |
|   | .2 | Sheet Metal and Air Conditioning Contractors' National Association (SMACNA). <ul style="list-style-type: none"><li>.1 SMACNA HVAC Duct Construction Standards - Metal and Flexible, 2nd Edition [1995] and Addendum No. 1, [1997].</li><li>.2 SMACNA HVAC Air Duct Leakage Test Manual, [1985], 1st Edition.</li></ul>   |
| <u>1.4 SUBMITTALS</u>                     | .1 | Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.  |
| <u>1.5 QUALITY ASSURANCE</u>              | .1 | Certification of Ratings: <ul style="list-style-type: none"><li>.1 Catalogue or published ratings shall be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.</li></ul>  |
|   | .2 | Contractor Certification: The Contractor shall certify the following: <ul style="list-style-type: none"><li>.1 The products and systems were installed in strict compliance with the specifications, manufacturer's recommendations and all applicable local or state codes.</li><li>.2 The specified field tests have been satisfactorily performed.</li><li>.3 The ductwork was protected from dust and debris throughout construction and cleaned in accordance with Section 21 05 01</li></ul> |
| <u>1.6 DELIVERY, STORAGE AND HANDLING</u> | .1 | Protect on site stored or installed absorptive material from moisture damage.  |

## PART 2 - PRODUCTS

- |                 |    |  |
|-----------------|----|--|
| <u>2.1 SEAL</u> | .1 | All Ductwork and plenums with a pressure class rating shall be |
|-----------------|----|--|

#### CLASSIFICATION

- constructed to seal class A in conformance with ASHRAE 90.1.
- .1 The specific article referenced in ASHRAE 90.1 is 6.4.4.2. Duct Sealing. This is applicable to most ductwork on this project (all ducts connected to a fan system). The pressure class of all duct systems can be read from the external static listed in the associate equipment schedule, and if not provided can be assumed at 1" w.c. An example of a non-pressure class duct would be a transfer duct or cross talk – these can be sealed to Class C. Also refer to section 23 05 94 for the intent for pressure testing of the ducted air system.
  - .2 All other ductwork shall be constructed to a seal class C
    - .1 An example of a non-pressure class duct would be a transfer duct or cross talk – these can be sealed to Class C. Also refer to section 23 05 94 for the intent for pressure testing of the ducted air system
  - .3 Seal classification:
    - .1 Class A: longitudinal seams, transverse joints, duct wall penetrations and connections made airtight with sealant and tape.
    - .2 Class C: transverse joints and connections made air tight with gaskets, sealant, tape], or combination thereof. Longitudinal seams unsealed.

#### 2.2 SEALANT

- .1 Sealant: Low VOC oil resistant, water borne, polymer type flame resistant duct sealant. Temperature range of minus 30 degrees C to plus 93 degrees C.

#### 2.3 TAPE

- .1 Tape: polyvinyl treated, open weave fiberglass tape, 50 mm wide.
- .2 Pressure sensitive tape shall not be used as the primary sealant, unless it has been certified to comply with UL-181A or UL-181B as per ASHRAE.

#### 2.4 DUCT LEAKAGE

- .1 All ductwork designed to operate at static pressures in excess of 750 PA and all exterior ductwork shall be tested as required by ASHRAE 90.1.
- .2 Duct Leakage Testing shall be performed in accordance with SMACNA HVAC Air Duct Leakage Test Manual.

#### 2.5 FITTINGS

- .1 Fabrication: to SMACNA and ASHRAE.
- .2 Radius elbows.
  - .1 Rectangular: standard radius, short radius with single thickness turning vanes, Centreline radius: 1.5 times width of duct.
  - .2 Round: smooth radius. Centreline radius: 1.5 times diameter.
- .3 Mitred elbows, rectangular:
  - .1 To 400 mm: with minimum single thickness turning vanes.

- .2 Over 400 mm: with double thickness turning vanes.
  - .4 Branches:
    - .1 Rectangular main and branch: with 45 degrees entry on branch.
    - .2 Round main and branch: enter main duct at 45 degrees with conical connection.
    - .3 Provide volume control damper in branch duct near connection to main duct.
    - .4 Main duct branches: with splitter damper.
  - .5 Transitions:
    - .1 Diverging: 20 degrees maximum included angle.
    - .2 Converging: 30 degrees maximum included angle.
  - .6 Offsets:
    - .1 Full or short radiused elbows as indicated.
  - .7 Obstruction deflectors: maintain full cross-sectional area.
    - .1 Maximum included angles: as for transitions.
- 2.6 FIRE STOPPING
- .1 Retaining angles around duct, on both sides of fire separation in accordance with Section 07 84 00 - Firestopping.
  - .2 Fire stopping material and installation must not distort duct.
- 2.7 GALVANIZED STEEL
- .1 Lock forming quality: to ASTM A 653/A 653M, G90/Z275 zinc coating.
  - .2 Thickness, fabrication and reinforcement: to ASHRAE and SMACNA.
  - .3 Joints: to ASHRAE and SMACNA. Proprietary manufactured duct joints to be considered if meet class A seal.
- 2.8 HANGERS AND SUPPORTS
- .1 Hangers and Supports: in accordance with Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
  - .2 Strap hangers: of same material as duct but next sheet metal thickness heavier than duct.
    - .1 Maximum size duct supported by strap hanger: 500.
  - .3 Hanger configuration: to ASHRAE and SMACNA.
    - .1 Hangers: galvanized steel angle hangers with supporting rods, locking nuts and washers to ASHRAE and SMACNA as per the following table:

Duct Size (mm)	Angle Size (mm)	Rod Size (mm)	Spacing (m)
up to 750	25 x 25 x 3	6	3
751 to 1050	40 x 40 x 3	6	3
1051 to 1500	40 x 40 x 3	10	3
1501 to 2100	50 x 50 x 3	10	2.5
2101 to 2400	50 x 50 x 5	10	2.5

2401 and over 50 x 50 x 6 10 2.5

- .4 Upper hanger attachments:
  - .1 For concrete: manufactured concrete inserts.
  - .2 For steel joist: manufactured joist clamp, steel plate washer.
  - .3 For steel beams: manufactured beam clamps.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- .1 Do work in accordance with ASHRAE and SMACNA standards.
- .2 Do not break continuity of insulation vapour barrier with hangers or rods.
  - .1 Insulate strap hangers 100 mm beyond insulated duct
  - .2 Ensure diffuser is fully seated
- .3 Support risers in accordance with SMACNA.
- .4 Install breakaway joints in ductwork on sides of fire separation.
- .5 Install proprietary manufactured flanged duct joints in accordance with manufacturer's instructions.
- .6 Manufacture duct in lengths and diameter to accommodate installation of ½" internal acoustic duct lining where indicated on drawings.
- .7 Ground across flexible connector with No. 2/0 braided copper strap.
- .8 Provide offsets as required to prevent interferences.
- .9 Install Air Duct Accessories defined in Section 23 33 00.
- .10 Install 1" test plugs, with chain and cap, where required to accommodate testing and balancing instruments.

#### 3.2 HANGERS

- .1 Strap hangers: install in accordance with SMACNA.
- .2 Angle hangers: complete with locking nuts and washers.

#### 3.3 SEALING AND TAPING

- .1 Apply sealant to outside of joint to manufacturer's recommendations.
- .2 Bed tape in sealant and recoat with minimum of one coat of sealant to manufacturers recommendations.

#### 3.4 LEAKAGE TESTS

- .1 Perform visual inspections throughout construction to ensure proper sealing.
- .2 Self-perform trail leakage tests as required to ensure sealing techniques are adequately achieving desired seal classification.

- .3 Provide ductwork free of audible leaks in quite ambient.
- .4 Complete tests before performance insulation or concealment Work.

END OF SECTION

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 Ontario Electrical Safety Code 27<sup>th</sup> Edition - CSA C22.1-18, Canadian Electrical Code, Part 1 (24<sup>th</sup> edition) Safety Standard for Electrical Installations and Ontario Amendments to that Code.
  - .2 CSA C22.2 No 141.
  - .3 CAN3-C235-83(R2000), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
  - .1 IEEE SP1122-[2000], The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.
- .2 CAN/ULC-S524 – Standard for the Installation of Fire Alarm Systems
- .3 CAN/ULC-S139 Standard Method of Fire Test for Evaluation of Integrity of Electrical Cables
- .4 Ontario Building Code
- .5 All governing municipal requirements

### 1.2 DEFINITIONS

- .1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

### 1.3 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235.
- .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
  - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language operating requirements: Provide identification nameplates and labels for control items in English.

### 1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: submit WHMIS MSDS in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 01 - Hazardous Materials.
- .3 Shop drawings:
  - .1 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and

- arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure coordinated installation.
  - .2 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
  - .3 Indicate on drawings clearances for operation, maintenance, and replacement of operating equipment devices.
  - .4 Submit copies of drawings and product data to authority having jurisdiction and inspection authorities as required.
  - .5 If changes are required, notify Consultant of these changes before they are made.
- .4 Quality Control: in accordance with Section 01 45 00 - Quality Control.
- .1 Provide CSA certified equipment and material.
  - .2 Where CSA certified equipment and material is not available, submit such equipment and material to inspection authorities for special approval before delivery to site.
  - .3 Submit test results of installed electrical systems and instrumentation.
  - .4 Permits and fees: in accordance with General Conditions of contract.
  - .5 Submit, upon completion of Work, load balance report as described in PART 3 - LOAD BALANCE.
  - .6 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Consultant.
  - .7 Manufacturer's Field Reports: submit to Consultant manufacturer's written report, within 7 days of review, verifying compliance of Work as described in PART 3 - FIELD QUALITY CONTROL.

## 1.5 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Qualifications: Electrical work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license as per the conditions of Provincial Act respecting manpower vocational training and qualification.
- .3 Site Meetings:
- .1 In accordance with Section 01 32 16 - Construction Progress Schedule.
  - .2 Site Meetings: as part of Manufacturer's Field Services, schedule site visits, to review Work, at stages listed.
  - .3 After delivery and storage of products, and when preparatory Work is complete but before installation begins.

- .4 Twice during progress of Work at 25% and 60% complete.
- .5 Upon completion of Work, after cleaning is carried out.

.4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29- Health and Safety Requirements.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- .1 Material Delivery Schedule: coordinate delivery of material to suit proposed construction schedule.
- .2 Construction/Demolition Waste Management and Disposal: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

#### 1.7 SYSTEM STARTUP

- .1 Instruct Consultant and operating personnel in operation, care and maintenance of systems, system equipment and components.
- .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation and ensure that operating personnel are conversant with aspects of its care and operation.

#### 1.8 OPERATING INSTRUCTIONS AND MAINTENANCE DATA

- .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
- .2 Operating instructions to include following:
  - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
  - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
  - .3 Safety precautions.
  - .4 Procedures to be followed in event of equipment failure.
  - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
- .3 Names and addresses of nearest suppliers for all items included in maintenance manuals.
- .4 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
- .5 Post instructions where directed.
- .6 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.



- .7 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

## PART 2 - PRODUCTS

- 2.1 MATERIALS AND EQUIPMENT .1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.

- .2 Material and equipment to be CSA certified. Where CSA certified material and equipment are not available, obtain special approval from inspection authorities before delivery to site and submit such approval as described in PART 1 - SUBMITTALS.

- .3 Factory assembled control panels and component assemblies.

2.2 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

- .1 Verify installation and co-ordination responsibilities related to motors, equipment and controls with mechanical contractor and general contractor prior to proceeding with rough-ins and wiring on-site.

2.3 WARNING SIGNS

- .1 Warning Signs: in accordance with requirements of authority having jurisdiction, inspection authorities and Consultant.
- .2 Porcelain enamel signs, minimum size 175 x 250 mm.

2.4 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are 90 degrees Celsius rated suitable for either copper or aluminum conductors.

2.5 EQUIPMENT IDENTIFICATION

- .1 All power device components including switches, receptacles and junction boxes are to be labeled as indicated on the drawings.
  - .1 Provide clear printed adhesive label tags affixed to bottom front of faceplate in BLACK for normal power distribution.
  - .2 Provide white printed adhesive label tags affixed to wall on inside of faceplate to indicate circuit feeding location to allow faceplates to be put back in the correct location if removed in the future.

2.6 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.

2.7 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

	Prime	Auxiliary
up to 250 V	Yellow	Blue
Fire Alarm	Red	

2.8 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CSA C22.3 No.1 except where specified otherwise.

3.2 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.3 CONDUIT AND CABLE INSTALLATION

- .1 Install conduit and sleeves prior to pouring of concrete.
  - .1 Sleeves through concrete: schedule 40 steel pipe, sized for free passage of conduit, and protruding 50 mm.
- .2 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
- .3 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.
- .4 Arrange with Division 7 for flashing and weatherproofing of holes through exterior walls.
- .5 Provide wire with flame spread rating suitable for application. (ie FT1, FT4, FT6 or as required to suit ULC S139)

3.4 LOCATION OF OUTLETS

- .1 Locate outlets in accordance with Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.

- .2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
- .3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.
- .4 Locate light switches on latch side of doors.
  - .1 Locate disconnect devices in mechanical rooms on latch side of floor.

### 3.5 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centre-line of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at following heights unless indicated otherwise.
  - .1 Local switches: 1050 mm to centre of box.
  - .2 Wall receptacles:
    - .1 General: 400 mm to centre or as indicated on the plans.
    - .2 Above top of counters or counter splash backs (A.C.): 200 mm to centre.
    - .3 In mechanical/electrical rooms: 1000 mm to bottom.

### 3.6 PROTECTION

- .1 Protect exposed live equipment during construction for personnel safety.
- .2 Shield and mark live parts 'LIVE 120 VOLTS' or with appropriate voltage.
- .3 Arrange for installation of temporary doors for rooms containing electrical distribution equipment. Keep these doors locked except when under direct supervision.

### 3.7 ACCESS DOORS

- .1 Supply access doors for furred ceilings or spaces for access to electrical fitments for installation under section erecting the walls or ceilings.
- .2 Access doors, unless otherwise specified or shown, shall be flush mounted 600 × 600 mm (24" × 24") for body entry, at least 12 gauge steel, finished prime coat only, with concealed hinges, screwdriver latches, anchor straps, rounded safety corners and shall open 180 degrees. Doors shall be of approved manufacturer with published literature.

### 3.8 COORDINATION OF SERVICES AND PENETRATIONS

- .1 Coordinate with G.C. for all penetrations and openings required for electrical services routed through any proposed structural walls, etc. to suit proposed field installation method; to be addressed with specific systems as required at time of shop drawing review.

### 3.9 FIREPROOFING

- .1 Provision of all fire stopping required for electrical systems and

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**Barrier Free Upgrades Our Lady of Fatima Catholic  
School**

For the Huron-Superior Catholic District School Board  
14 Strathcona Street, Chapleau, Ontario

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associated penetrations of rated walls, floors and partitions shall be the responsibility of Division 7 unless specifically noted otherwise on the drawings.

3.10 CONSTRUCTION  
COORDINATION

.1 Coordinate with G.C. for all work associated with the building construction for access and to suit various scopes of Architectural and Mechanical work impacting the ability of this section to complete Section 26 scope of work accordingly.

3.11 CLEANING

.1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results Electrical
- .2 Section 26 05 32 – Outlet Boxes, Conduits and Fittings

1.2 PRODUCT DATA

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

PART 2 - PRODUCTS

2.1 BUILDING WIRES

- .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
- .2 120V Control circuits are permitted to be #14AWG Copper.
- .3 Copper conductors: size as indicated, with 600V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE RWU90 XLPE where used underground or in floor slabs, both Jacketed.
- .4 Type TWU, TWH, T90 Nylon not permitted.

2.2 TECK 90 CABLE

- .1 Cable: in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Conductors:
  - .1 Grounding conductor: copper, size as indicated.
  - .2 Circuit conductors: copper, size as indicated.
- .3 Insulation:
  - .1 Cross-linked polyethylene XLPE.
  - .2 Rating: 600V.
- .4 Inner jacket: polyvinyl chloride material.
- .5 Armour: interlocking
- .6 Overall covering: thermoplastic polyvinyl chloride, meeting requirements of UL Vertical Tray Fire Test FT4 with maximum flame travel of 1220mm (48")
- .7 Fastenings:
  - .1 One hole steel or zinc straps to secure surface cables 50 mm and smaller. Two-hole steel straps for cables larger than 50 mm.
  - .2 Channel type supports for two or more cables spaced at intervals required by OESC Code
  - .3 Threaded rods: 12 mm diameter to support suspended channels.

- .8 Connectors:
- .1 Watertight, approved for TECK cable.

### 2.3 VFD RATED CABLE

- .1 Conductors: shall be annealed stranded tinned copper per ASTM B3, B8 and B33, insulation rated for 90 Degrees C, Wet/Dry operating temperature, size as indicated, CSA Approved.
- .2 Insulation: Thickness shall have a minimum average wall thickness of 30mils. The insulation material shall be XLPE with a XHHW-2 listing per UL 44. Each insulated conductor shall be identified in accordance with ICEA Method 4 Colour Coding
- .3 Insulation: 1000V
- .4 Standard of Acceptance: OLFLEX VFD SLIM by Lapp Group Canada.

### 2.4 ARMOURED CABLES

- .1 Conductors: insulated, copper, size as indicated.
- .2 Type: AC90
- .3 Armour: interlocking type fabricated from galvanized steel strip.
- .4 Connectors: anti short connectors.
- .5 Isolated ground wire with bare bond for all isolated power outlets where indicated on the drawings.

### 2.5 CONTROL CABLES

- .1 Type: LVT: 2, 4, 6 or 8 soft annealed copper conductors, sized as indicated:
  - .1 Insulation: thermoplastic.
  - .2 Sheath: cotton braid
- .2 All 0-10V dimming wiring routed with line voltage wiring to be rated 600V in accordance with OESC requirements for routing in shared raceway and include foil shield with drain wire as indicated on the drawings with the drain wire bonded at source supply ONLY and routed continuous through pathway to luminaire and NOT bonded at device end or along the route as indicated on the drawings for all "ST" step light type fixtures.

### 2.6 NON-METALLIC SHEATHED CABLE

- .1 Shall not be used on this project.

## PART 3 - EXECUTION

### 3.1 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform insulation tests before energizing electrical system.

**3.2 GENERAL CABLE  
INSTALLATION**

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).
- .2 Cable Colour Coding: to Section 26 05 00 Common Work Results for Electrical.
- .3 Conductor length for parallel feeders to be identical.
- .4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .5 Wiring in walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided unless indicated.
- .6 Branch circuit wiring for surge suppression receptacles and permanently wired computer and electronic equipment to be 2-wire circuits only, i.e. common neutrals not permitted.
- .7 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

**3.3 INSTALLATION OF  
BUILDING WIRES**

- .1 Install wiring as follows:
  - .1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.
  - .2 In surface and lighting fixture raceways in accordance with Section 26 50 00, 26 05 33.

**3.4 INSTALLATION OF  
TECK90 CABLE (0  
-1000 V)**

- .1 Group cables wherever possible on channels.
- .2 Not to be installed in lengths greater than 6' unless with the written permission of the Consultant.

**3.5 INSTALLATION OF VFD  
RATED CABLE**

- .1 Install VFD Rated cable on line and load sides of all VFDs and reactors where required; some VFD's are located in HVAC units and will come factory connected.

**3.6 INSTALLATION OF  
ARMoured CABLES**

- .1 Group cables wherever possible on channels.
- .2 Type AC90 is only to be used in extremely short lengths (of 10' or less) and are only to be used for fixture drops from conduit boxes unless utilized for isolated ground receptacle where indicated on the drawings.
- .3 AC90 is never to be used for home runs for lighting or power devices not indicated as isolated ground type and will be ordered to be removed if so installed.
- .4 Use AC90 for this purpose only and only where specifically called out on the drawings.

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3.7 INSTALLATION OF  
CONTROL CABLES

- .1 Install control cables in conduit from cable tray to devices.
- .2 Install control cables in cable tray.
- .3 Ground control cable shield.

3.8 INSTALLATION OF  
NON-METALLIC  
SHEATHED CABLE

- .1 Never use Non-Metallic Sheathed Cable.

END OF SECTION



---

PART 1 - GENERAL

1.1 RELATED SECTIONS .1 Section 26 05 00 - Common Work Results - Electrical.

1.2 REFERENCES .1 Canadian Standards Association, (CSA International)

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 Copper conductor: bare, soft annealed, stranded, untinned copper ground conductor for system and equipment ground, size as indicated, minimum as dictated by code.

.2 Rod electrodes: copper clad steel 19 mm dia by 3 m long, minimum.

.3 Grounding conductors: bare stranded copper, untinned, soft annealed, minimum 3/0 AWG copper conductor to each ground electrode.

.4 Insulated grounding conductors: green, type TWH or TWU, where indicated.

.5 Ground bus: copper, size as indicated, complete with 600V insulated supports, fastenings, connectors.

.6 Supply non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:

.1 Grounding and bonding bushings.

.2 Protective type clamps.

.3 Bolted type conductor connectors.

.4 Thermit welded type conductor connectors.

.5 Bonding jumpers, straps.

.6 Pressure wire connectors

.7 Compression ground connectors.

.7 Compression grounding connectors used to make permanent grounding connections must be rated for direct burial, embedding in concrete and for above grade applications

.1 Compression connectors shall be made of pure, wrought copper, meeting ASTM B187, essentially the same as the conductors being connected.

.2 Cast connectors shall be made of copper base alloy according to ASTM B30 (latest revision).

.3 All connectors must be of heavy-duty design and must be equivalent in current carrying capacity to the maximum size copper conductors being joined while maintaining high mechanical strength and electrical integrity.

.4 Terminals and splices may accommodate only one conductor size. All other connectors must be range taking.

.5 All connectors must be designed to provide high integrity connections.

- .6 Connectors must be pre-filled or filled at time of connection with a corrosion inhibiting compound which is compatible with the conductors being joined.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION GENERAL

- .1 Install complete permanent, continuous system and equipment grounding systems including conductors, connectors, accessories, as indicated.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .5 Soldered joints not permitted.
- .6 Install bonding wire for flexible conduit, connected at both ends to grounding bushing, solder-less lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.
- .7 Install flexible ground straps for bus duct enclosure joints, where such bonding is not inherently provided with equipment.
- .8 Install separate ground conductor, green TW75 insulation to outdoor lighting standards, where applicable.
- .9 Bond single conductor, metallic armoured cables to cabinet at supply end, provide non-metallic entry plate at load end.

#### 3.2 SYSTEM AND CIRCUIT GROUNDING

- .1 Install system and circuit grounding connections to the neutrals of the electrical distribution system.

#### 3.3 EQUIPMENT GROUNDING

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, splitters, duct systems, frames of motors, starters, control panels, building steel work, distribution panels, outdoor lighting.

#### 3.4 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results - Electrical.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Consultant and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.
- .4 Disconnect ground fault indicator during tests.

END OF SECTION

PART 1 - GENERALPART 2 - PRODUCTS

- |                             |    |  |
|-----------------------------|----|--|
| <u>2.1 SUPPORT CHANNELS</u> | .1 | U shape, size 41 x 41mm (1 5/8"), 2.5 mm thick, surface mounted, suspended by 1/2" Threaded Rod or embedded in concrete as required. |
|                             | .2 | Galvanized Steel used indoors.   |
|                             | .3 | Stainless Steel where required outdoors.   |

PART 3 - EXECUTION

- |                         |    |  |
|-------------------------|----|--|
| <u>3.1 INSTALLATION</u> | .1 | Secure equipment to hollow or solid masonry, tile and plaster surfaces with lead anchors or nylon shields.   |
|                         | .2 | Secure equipment to poured concrete with expandable inserts.   |
|                         | .3 | Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.  |
|                         | .4 | Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation. |
|                         | .5 | Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.  |
|                         | .6 | Fasten exposed conduit or cables to building construction or support system using straps.  |
|                         | .1 | One-hole steel straps to secure surface conduits and cables 50 mm and smaller.   |
|                         | .2 | Two-hole steel straps for conduits and cables larger than 50 mm.   |
|                         | .3 | Beam clamps to secure conduit to exposed steel work.   |
|                         | .7 | Suspended support systems.   |
|                         | .1 | Support individual cable or conduit runs with 12 mm dia threaded rods and spring clips.  |
|                         | .2 | Support 2 or more cables or conduits on channels supported by 12 mm dia threaded rod hangers where direct fastening to building construction is impractical.                                   |
|                         | .8 | Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.                                      |
|                         | .9 | Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.  |

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Page 2

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- .10 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .11 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Consultant
- .12 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.
- .13 Where cutting of galvanized strut is required, touch up the cut ends with galvanizing paint.

END OF SECTION

## PART 1 - GENERAL

<u>1.1 RELATED SECTIONS</u>	.1	Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.
<u>1.2 REFERENCES</u>	.1	Canadian Standards Association (CSA International) .1 OESC 28 <sup>th</sup> Edition - CSA C22.1-21, Canadian Electrical Code, Part 1 (25th edition) Safety Standard for Electrical Installations and Ontario Amendments to that Code.
<u>1.3 SUBMITTALS</u>	.1	Provide submittals in accordance with Section 01 33 00 - Submittal Procedures
	.2	Product Data: .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
	.3	Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.

## PART 2 - PRODUCTS

<u>2.1 SPLITTERS</u>	.1	Construction: sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position.
	.2	Terminations: main and branch lugs or connection blocks to match required size and number of incoming and outgoing conductors as indicated.
	.3	Spare Terminals: minimum three spare terminals or lugs on each connection or lug block sized less than 400 A.
<u>2.2 JUNCTION AND PULL BOXES</u>	.1	Construction: welded steel enclosure.
	.2	Covers Flush Mounted: 25 mm minimum extension all around.
	.3	Covers Surface Mounted: screw-on flat turned edge covers.

2.3 CABINETS

- .1 Construction: welded sheet steel, hinged door, handle, latch and catch
- .2 Type E Empty: flush overlapping sides mounting as required.
- .3 Type T Terminal: flush overlapping sides mounting as required containing 19 mm G1S plywood backboard.

PART 3 - EXECUTION

3.1 SPLITTER  
INSTALLATION

- .1 Mount plumb, true and square to building lines.
- .2 Extend splitters full length of equipment arrangement except where indicated otherwise.

3.2 JUNCTION, PULL  
BOXES AND CABINETS  
INSTALLATION

- .1 Install pull boxes in inconspicuous but accessible locations.
- .2 Mount cabinets with top not higher than 2 m above finished floor except where indicated otherwise.
- .3 Install terminal block as indicated in Type T cabinets.
- .4 Coordinate all main junction and pull boxes to suit conduit runs and wire sizes are indicated. Install additional pull boxes as required by CSA C22.1.

3.3 IDENTIFICATION

- .1 Equipment Identification: to Section 26 05 00- Common Work Results for Electrical
- .2 Identification Labels: size 2 indicating system name voltage and phase.

END OF SECTION

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Section 26 05 32  
OUTLET BOXES, CONDUIT AND FITTINGS  
Page 1

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## PART 1 - GENERAL

- |  |    |  |
|--|----|--|
| <u>1.1 LOCATION OF CONDUITS</u>                | .1 | Drawings do not show all conduits. Those shown are in diagrammatic form only.                          |
| <u>1.2 REFERENCES</u>                          | .1 | Canadian Standards Association (CSA International)   |
|  | .1 | CSA C22.1-12, Ontario Electrical Safety Code, Part 1   |
| <u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.                         |
| <u>1.4 DELIVERY, STORAGE AND HANDLING</u>      | .1 | Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements. |

## PART 2 - PRODUCTS

- |   |    |  |
|---|----|--|
| <u>2.1 CONDUIT</u>                          | .1 | Rigid PVC Conduit (RPVC)   |
|   | .2 | Rigid PVC Conduit Type DB2 (DB2)   |
|   | .3 | Rigid Galvanized Steel Conduit (RGSC)  |
|   | .4 | Electrical Metallic Tubing (EMT)   |
|   | .5 | Electrical Non-Metallic Tubing (ENMT)  |
|   | .6 | Flexible Metal Conduit and Liquidtight Flexible Metal Conduit  |
| <u>2.2 OUTLET AND CONDUIT BOXES GENERAL</u> | .1 | Size boxes in accordance with CSA C22.1.   |
|   | .2 | 102 mm square or larger outlet boxes as required.  |
|   | .3 | Gang boxes where wiring devices are grouped.   |
|   | .4 | Blank cover plates for boxes without wiring devices.   |
|   | .5 | 347 V outlet boxes for all 347 V line voltage switching devices.                                     |
|   | .6 | Combination boxes with barriers where outlets for more than one system are grouped.                  |
|   | .7 | Standard of Acceptance: Iberville, Hubbell or equal Canadian manufactured and CSA certified product. |

2.3 GALVANIZED  
STEEL OUTLET BOXES

- .1 One-piece electro-galvanized construction.
- .2 Single and multi-gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.
- .3 Utility boxes for outlets connected to surface mounted EMT conduit, minimum size 102 x 54 x 48 mm.
- .4 102 mm square or octagonal outlet boxes for lighting fixture outlets.
- .5 Extension and plaster rings for flush mounting devices in finished plaster and tile walls.
- .6 Standard of Acceptance: Iberville, Hubbell or equal Canadian manufactured and CSA certified product.

2.4 MASONRY BOXES

- .1 Electro-galvanized steel masonry single and multi-gang boxes for devices flush mounted in exposed block walls.

2.5 CONCRETE BOXES

- .1 Electro-galvanized sheet steel concrete type boxes for flush mount in concrete with matching extension and plaster rings as required.

2.6 FLOOR BOXES

- .1 Refer to Electrical Schedules for Types of Floorbox complete with manufacturer and insert requirements.
- .2 Standard of Acceptance: As noted in Electrical Equipment Schedule or equal/alternate product approved by the Consultant.

2.7 CONDUIT BOXES

- .1 Cast FS aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of devices.
- .2 Standard of Acceptance: Iberville, Hubbell or equal Canadian manufactured and CSA certified product.

2.8 PULSTRINGS

- .1 Polypropylene nylon, 6mm (1/4") for conduits to 1"
- .2 Braided Nylon, 12mm (1/2") for conduits to 4".

2.9 FITTINGS - GENERAL

- .1 Bushing and connectors with nylon insulated throats.
- .2 Knock-out fillers to prevent entry of debris.
- .3 Conduit outlet bodies for conduit up to 35mm and pull boxes for larger conduits.
- .4 Double locknuts and insulated bushings on sheet metal boxes.



### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- .1 Support boxes independently of connecting conduits.
- .2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
- .3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.
- .4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Do not install reducing washers.
- .5 Vacuum clean interior of outlet boxes before installation of wiring devices.
- .6 Identify systems for outlet boxes as required.
- .7 Conceal conduit in walls, partitions and ceilings. Provide access panels in areas where access is required to junction boxes.
- .8 Install EMT surface mounted in mechanical, electrical telecommunications rooms and the overhead link.
- .9 Install Rigid Galvanized Conduit where subject to mechanical injury.
- .10 Provide Expansion Fittings where conduits pass over expansion joints.
- .11 Seal conduits passing through an outside wall with duct seal at the closest outlet box on the outside wall. If the distance from the nearest outlet box to point where conduit passes through wall exceeds 1524mm (5'), install an outlet box just inside the wall and seal conduit at that location. Install duct seal after all wiring has been completed.
- .12 Install rigid galvanized steel conduit 762mm (30") below finished grade and extend 75mm (3") beyond the outside wall surface where conduit runs pass through the foundation walls. Couple to rigid PVC conduit for continuation of underground electrical or telecommunication service to outdoor locations.
- .13 Do not use perforated steel supports (all round)
- .14 Make exposed conduit parallel to the building lines to present a neat and tidy appearance. Make offsets at similar locations and parallel in areas where two or more runs are together. Failure to coordinate conduit runs with each other will result in the Consultant rejecting the installation.

- .15 Use liquidtight flexible conduit for final connections to motors and loads subject to vibration.
- .16 Run conduit to avoid proximity to water or heating pipes. Do not run within 75mm of pipes, and where unavoidable, contact Consultant for direction. Proceed with direction from Consultant.
- .17 Lengths of Flexible Metallic Conduit are not permitted to be longer than 6' unless prior permission has been obtained from the Consultant, under documented writing.
- .18 Type AC90 has very limited use, refer to Section 260521.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 260521 – Wires and Cables
- .2 Section 260529 – Hangars and Supports
- .3 Section 260532 – Outlet Boxes, Conduits and Fittings

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA C22.2 No. 18-98(R2003), Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
  - .2 CSA C22.2 No. 45-M1981(R2003), Rigid Metal Conduit.
  - .3 CSA C22.2 No. 56-04, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
  - .4 CSA C22.2 No. 83-M1985(R2003), Electrical Metallic Tubing.
  - .5 CSA C22.2 No. 211.2-M1984(R2003), Rigid PVC (Unplasticized) Conduit.
  - .6 CAN/CSA C22.2 No. 227.3-05, Nonmetallic Mechanical Protection Tubing (NMPT), A National Standard of Canada (February 2006).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data: submit manufacturer's printed product literature, specifications and datasheets.
  - .1 Submit cable manufacturing data.
- .3 Quality assurance submittals:
  - .1 Test reports: submit certified test reports.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Instructions: submit manufacturer's installation instructions.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

PART 2 - PRODUCTS

2.1 CABLES AND REELS

- .1 Provide cables on reels or coils.
  - .1 Mark or tag each cable and outside of each reel or coil, to indicate cable length, voltage rating, conductor size, and manufacturer's lot number and reel number.
- .2 Each coil or reel of cable to contain only one continuous cable without splices.
- .3 Identify cables for exclusively dc applications.
- .4 Reel and mark shielded cables rated 2,001 volts and above.

2.2 CONDUITS

- .1 Rigid metal conduit: to CSA C22.2 No. 45, galvanized steel threaded.
- .2 Epoxy coated conduit: to CSA C22.2 No. 45, with zinc coating and corrosion resistant epoxy finish inside and outside.
- .3 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.
- .4 Rigid PVC conduit: to CSA C22.2 No. 211.2.
- .5 Flexible metal conduit: to CSA C22.2 No. 56, steel, liquid-tight flexible metal.
- .6 Flexible PVC conduit: to CAN/CSA-C22.2 No. 227.3.

2.3 CONDUIT FASTENINGS

- .1 One hole steel straps to secure surface conduits NPS 2" (50 mm) and smaller.
  - .1 Two-hole steel straps for conduits larger than NPS 2" 50 mm.
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Channel type supports for two or more conduits at maximum length permitted for smallest conduit on rack by code.
- .4 Threaded rods, 12 mm diameter, to support suspended channels.

2.4 CONDUIT FITTINGS

- .1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating: same as conduit.
- .2 Ensure factory "ells" where 180 degrees bends for NPS 1" (25 mm) and larger conduits.
- .3 EMT Connectors:
  - .1 Watertight connectors and couplings for EMT where routed below sprinkler heads, installed in location exposed to the weather or at exposed penetrations into the top of electrical equipment.
  - .2 Set screw type steel connectors are acceptable where EMT

conduit is routed in walls, above ceiling and/or sprinkler heads where there is no possibility of direct water stream or ingress of moisture.

2.5 EXPANSION FITTINGS  
FOR RIGID CONDUIT

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 100mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.
- .3 Weatherproof expansion fittings for linear expansion at entry to panel.

PART 3 - EXECUTION

3.1 MANUFACTURER'S  
INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Conceal conduits except in mechanical and electrical service rooms and in unfinished areas.
- .3 Use epoxy coated conduit underground and in corrosive areas.
- .4 Use electrical metallic tubing (EMT) except in cast concrete, above 2.4 m not subject to mechanical injury.
- .5 Use Rigid PVC conduit underground and in corrosive areas.
- .6 Use flexible metal conduit for connection to motors in dry areas, connection to recessed incandescent fixtures without prewired outlet box, connection to surface or recessed fluorescent fixtures, work in movable metal partitions.
- .7 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations.
- .8 Use explosion proof flexible connection for connection to explosion proof motors.
- .9 Install conduit sealing fittings in hazardous areas.
  - .1 Fill with compound.
- .10 Minimum conduit size for lighting and power circuits: NPS 1/2", (12 mm.)
- .11 Bend conduit cold:
  - .1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- .12 Mechanically bend steel conduit over 35 mm diameter.

- .13 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- .14 No Running of Threads Permitted
- .15 Install fish cord in empty conduits.
- .16 Run 2-NPS 1 (25 mm) spare conduits up to ceiling space and 2-NPS 1 (25 mm) spare conduits down to ceiling space from each flush panel.
  - .1 Terminate these conduits in 152 x 152 x 102 mm junction boxes in ceiling space or in case of an exposed concrete slab, terminate each conduit in surface type box.
- .17 Remove and replace blocked conduit sections.
  - .1 Do not use liquids to clean out conduits.
- .18 Dry conduits out before installing wire.
- .19 Use flexible metal conduit exposed only where specifically indicated on drawings or with approval of Consultant, or for final fixture tails, not longer than 10' and as above in .6.

### 3.3 SURFACE CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.
- .3 Run conduits in flanged portion of structural steel.
- .4 Group conduits wherever possible on suspended or surface channels, where applicable
- .5 Do not pass conduits through structural members except as indicated or with permission of Consultant.
- .6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

### 3.4 CONCEALED CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Do not install horizontal runs in masonry walls.
- .3 Do not install conduits in terrazzo or concrete toppings.

### 3.5 CONDUITS IN CAST-IN-PLACE CONCRETE

- .1 Locate to suit reinforcing steel.
- .2 Install in centre one third of slab.
- .3 Protect conduits from damage where they stub out of concrete.
- .4 Install sleeves where conduits pass through slab or wall.

- |   |    |  |
|---|----|--|
|   | .5 | Provide oversized sleeve for conduits passing through waterproof membrane before membrane is installed.                                  |
|   | .1 | Use cold mastic between sleeve and conduit.  |
|   | .6 | Conduits in slabs: minimum slab thickness 4 times conduit diameter.  |
|   | .7 | Encase conduits completely in concrete with minimum 25 mm concrete cover.  |
|   | .8 | Organize conduits in slab to minimize cross overs.   |
| <u>3.6 CONDUITS IN CAST-IN-PLACE SLABS ON GRADE</u> | .1 | Run conduits NPS 1 (25 mm) and larger below slab and encase in 75 mm concrete envelope.  |
|   | .1 | Provide 50 mm of sand over concrete envelope below floor slab.   |
| <u>3.7 CONDUITS UNDERGROUND</u>                     | .1 | Slope conduits to provide drainage.  |
|   | .2 | Waterproof joints (PVC excepted) with heavy coat of bituminous paint.  |
| <u>3.8 CLEANING</u>                                 | .1 | Proceed in accordance with Section 01 74 11 - Cleaning.  |
|   | .2 | On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment. |

END OF SECTION

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**PART 1 - GENERAL**

**1.1 RELATED REQUIREMENTS**

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**1.2 REFERENCES**

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- .1 Canadian Standards Association (CSA International).
- .1 CSA-C22.2 No. 5, Moulded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, tenth edition, and the second edition of NMX-J-266-ANCE).

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

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- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Include time-current characteristic curves for breakers with ampacity of 30A and over.

**PART 2 - PRODUCTS**

**2.1 BREAKERS GENERAL**

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- .1 Moulded-case circuit breakers, Circuit breakers, and Ground-fault circuit-interrupters: to CSA C22.2 No. 5
- .2 Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.
- .3 Common-trip breakers: with single handle for multi-pole applications.
- .4 Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.
- .1 Trip settings on breakers with adjustable trips to range from 3-8 times current rating.
- .5 Circuit breakers with interchangeable trips if applicable.
- .6 Circuit breakers to have minimum 10,000A symmetrical rms interrupting capacity rating.

**2.2 THERMAL MAGNETIC BREAKERS DESIGN A**

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- .1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

**2.3 MAGNETIC BREAKERS DESIGN B**

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- .1 Moulded case circuit breaker to operate automatically by means of magnetic tripping devices to provide instantaneous tripping for short circuit protection.



<u>2.4 CURRENT LIMITING AND SERIES RATED THERMAL MAGNETIC BREAKERS DESIGN C</u>	.1	Thermal magnetic breakers with current limiters.
	.1	Time current limiting characteristics of fuses limiters coordinated with time current tripping characteristics of circuit breaker.
	.2	Co-ordination to result in interruption by breaker of fault-level currents up to interrupting capacity of breaker.
	.2	Series rated breakers to be manufacturer tested and listed. Breakers to be applied following manufacturer's guidelines and accepted best practice.
	.1	Breakers applied following manufacturer's guidelines and accepted best practice.
<u>2.5 SOLID STATE TRIP BREAKERS</u>	.1	Moulded case circuit breaker to operate by means of solid-state trip unit with associated current monitors and self-powered shunt trip to provide inverse time current trip under overload condition, and long time, short time and instantaneous tripping for phase and/or ground fault short circuit protection as indicated on the drawings.
	.2	All breaker settings to be modified, and breakers replaced as necessary by contractor if supplied with distribution equipment prior to approval of selections during shop drawing review of short circuit study as specified in Sections 26 05 00.
<u>2.6 OPTIONAL FEATURES</u>	.1	Include where necessary to meet design intent indicated on the drawings:
	.1	Shunt trip.
	.2	Shunt close
	.3	Auxiliary switch.
	.4	Under-voltage release.
	.5	On-off locking device.
	.6	Handle mechanism.
<u>PART 3 - EXECUTION</u>		
<u>3.1 INSTALLATION</u>	.1	Install circuit breakers in appropriate location to suit equipment type as indicated.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results Electrical
- .2 Section 26 05 22 – Connectors and Terminations
- .3 Section 26 05 29 – Hangars and Supports
- .4 Section 26 05 32 – Conduits and Fittings

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
  - .1 ANSI C82.1, Lamp Ballasts-Line Frequency Fluorescent Lamp Ballast.
  - .2 ANSI C82.4, Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps Multi Supply Type.
- .2 American National Standards Institute/Institute of Electrical and Electronics Engineers ( ANSI/IEEE )
  - .1 ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
- .3 ASTM International Inc.
  - .1 ASTM F 1137-[00(2006)], Standard Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.
- .4 Canadian Standards Association (CSA International)
- .5 ICES-005, Radio Frequency Lighting Devices.
- .6 Underwriters' Laboratories of Canada (ULC)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Provide complete photometric data prepared by independent testing laboratory for luminaires where specified, for review by Consultant.
- .3 Quality assurance submittals: provide following in accordance with Section 01 45 00 - Quality Control.
  - .1 Manufacturer's instructions: provide manufacturer's written installation instructions and special handling criteria, installation sequence and cleaning procedures.

1.4 DELIVERY,

- .1 Deliver, store and handle materials in accordance with Section

STORAGE AND HANDLING

01 61 00 - Common Product Requirements.

- .2 Deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Packaging Waste Management: remove for reuse and return if applicable of pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Divert unused metal materials from landfill to metal recycling facility.
- .5 Disposal and recycling of fluorescent lamps as per local regulations.
- .6 Disposal of old PCB filled ballasts.

PART 2 - PRODUCTS

2.1 LAMPS

- .1 Supply luminaires complete with compatible lamps and ballasts/drivers as detailed and shown on the drawings using approved equipment as required by the lamp manufacturer.
- .2 Integral LED lamps and sources to be as specified or the LED drivers supplied with Consultant approved luminaires.

2.2 DRIVERS

- .1 LED driver, electronic 0-10V dimmable:
  - .1 Rating: voltage as indicated, for use with fixtures as indicated on plans.
  - .2 Power factor: minimum 90% with 95% of rated lamp lumens.
  - .3 Type: solid state.
  - .4 Input voltage range: plus or minus 10% of nominal.
  - .5 Temperature operation: Instant hot and cold (re)start, for use down to -30 Celsius for all exterior fixtures.
  - .6 Sound rated: Class A.
  - .7 Mounting: integral with luminaire or remote where noted.

2.3 FINISHES

- .1 Light fixture finish and construction to meet ULC listings and CSA certifications related to intended installation.

2.4 OPTICAL CONTROL DEVICES

- .1 As indicated in luminaire section of electrical equipment schedule, or provide fixture approved as an equal in writing by the consultant.
- .2 All acrylic diffusers to be tested in conformance with CAN/ULC-S102-M.

2.5 LUMINAIRES

- .1 As indicated on the drawings, or provide fixture approved as an equal/alternate in writing by the Consultant.

.2 All proposed product equal/alternates must meet design intent for light source, quality and visual appearance to suit aesthetic design intent.

.3 All alternate/equal requests to be submitted in writing for approval by the design professional a minimum of seven (7) calendar days prior to the tender closing date and must be made available to all bidders.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

.1 Locate and install luminaires as indicated.

.2 Provide adequate support to suit ceiling system.

#### 3.2 WIRING

.1 Connect luminaires to lighting circuits:

.1 Install flexible or rigid conduit for luminaires as indicated.

#### 3.3 LUMINAIRE SUPPORTS

.1 For suspended ceiling installations support luminaires independently of ceiling.

#### 3.4 LUMINAIRE ALIGNMENT

.1 Align luminaires mounted in continuous rows to form straight uninterrupted line.

.2 Align luminaires mounted individually parallel or perpendicular to building grid lines.

#### 3.5 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

**PART 1 - GENERAL**

<b><u>1.1 RELATED REQUIREMENTS</u></b>	.1	Section 26 05 00 - Common Work Results Electrical.
	.2	Section 26 05 21 - Wires and Cables 0-1000 V
	.3	Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings
<b><u>1.2 REFERENCES</u></b>	.1	Canadian Standards Association (CSA International)
	.1	CSA C22.2 No.141, Unit Equipment for Emergency Lighting.
<b><u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u></b>	.1	Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Data to indicate system components, mounting method, source of power and special attachments.
<b><u>1.4 WARRANTY</u></b>	.1	Standard 10-year manufacturer's warranty on all batteries.

**PART 2 - PRODUCTS**

<b><u>2.1 EQUIPMENT</u></b>	.1	Emergency lighting equipment: to CSA C22.2 No.141.
	.2	Refer to Electrical Equipment Schedule on plans for standard of acceptance.
	.3	Approved emergency lighting manufacturers required to meet or exceed the product specifications as indicated on the drawings are as follows: .1 Thomas & Betts (Lumacell, Emergi-lite, Ready-Lite), Stanpro. Beghelli.
<b><u>2.2 WIRING OF REMOTE HEADS</u></b>	.1	Conduit: type EMT in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.
	.2	Conductors: type and size in accordance with Section 26 05 21 - Wires and Cables 0-1000 V, sized to suit Contractor planned installation method in accordance with manufacturer's recommendations.

**PART 3 - EXECUTION**

<b><u>3.1 INSTALLATION</u></b>	.1	Install unit equipment and remote mounted fixtures.
	.2	Direct heads and adjust as necessary to meet requirements of local building inspector.

END OF SECTION